Planning and Environmental Consultants

# Management Plan

## Howth Head SAC and Howth Head Coast SPA

## 2025-2035

# DOCUMENT DETAILS

| | |
|---|---|
| Client: | **Fingal County Council** |
| Project Title: | **Howth Head SAC and Howth Head Coast SPA** |
| Project Number: | **240413** |
| Document Title: | **Management Plan** |
| Document File Name: | **CMP - F - 2025.08.28 - 240413** |
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Planning and Environmental Consultants

| Rev | Status | Date | Author(s) | Approved By |
|---|---|---|---|---|
| 01 | Draft | 30.07.2024 | MT | PR |
| 05 | Final | 29.08.2025 | MT | PR |

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# EXECUTIVE SUMMARY

This management plan was commissioned by Fingal County Council to provide management options for the two Natura 2000 sites on Howth: Howth Head Special Area of Conservation (SAC) and Howth Head Coast Special Protection Area (SPA). This plan and its priorities align with the statutory requirements of the EU Habitats Directive (92/43/EEC) and EU Birds Directive (79/409/EEC), which pertain to the SAC and SPA respectively. All available reports and data for this SAC and SPA were reviewed, and data extracted to inform detailed management actions. The plan was further informed by site visits, a detailed literature review, meetings with relevant personnel at Fingal County Council, the National Parks and Wildlife Service, and a public meeting.

The protection and enhancement of the Natura 2000 sites, and their associated Qualifying Interests (QI) is the primary focus of this plan. The biggest threat to the unique nature of the Nature 2000 sites on Howth (and its residents) is uncontrolled wildfires. Controlling these wildfires is the first priority. It is a second priority to improve the condition of the Qualifying Interests on Howth. The majority of management actions under this priority focus on the European dry Heath [4030] habitat on Howth, because this QI has the highest need for management. Thirdly, public access will be managed to protect dry heath where it is negatively affected by trampling. Lastly, this management plan considers how areas, where no QIs were previously mapped, can be improved for biodiversity, by restoring wetlands, planting native woodlands and increasing habitat diversity for the benefit of both flora and fauna.

# 1. INTRODUCTION

This document provides a comprehensive plan for the management of the Howth Head Special area of Conservation (SAC) and the Howth Head Coast Special Protection Area (SPA). The plan is designed to align with the statutory requirements of the EU Habitats Directive (92/43/EEC) and EU Birds Directive (79/409/EEC), which pertain to the SAC and SPA respectively.

The primary function of the plan is to facilitate the achievement of the Conservation Objectives for these designated sites as set out in the linked documents that are available on the website of the National Parks and Wildlife Service (NPWS):

- Howth Head SAC [000202]
- Howth Head Coast SPA [004113]

The plan also takes into account, the management of Howth Head SAC for biodiversity in general, public access, protection against wildfire, historic and contemporary land uses.

Section Two of this document sets out the long-term vision for Howth Head SAC and Howth Head Coast SPA. This transcends the statutory requirements of the Habitats Directive and describes the ecological, cultural and practical vision for the future, taking into account all the functions and uses of the area. It provides guiding principles for all present and future management decisions and ensures that they are working towards a clearly defined goal.

Section Three describes the methodology followed when preparing this plan. It lists the various studies that have been reviewed to inform this plan. It sets out the individual steps taken to identify and prioritise issues to be addressed and to prescribe the actions required to manage the area in a manner that is consistent with the achievement of the overall vision.

Section Four describes the actions to be taken for the maintenance and enhancement of the various relevant habitats and species within the SAC and SPA. It also describes the actions required to ensure that public access can be retained and managed without damaging the sensitive ecosystems that are found in the area and to protect the properties and habitats from fire. It provides guidance on monitoring and methods for adapting management in line with observed results.

Section Five provides recommendations for further study and research.

Section Six provides a detailed Management Plan for the SAC. This section divides the SAC into discreet management units in order to simplify the description of the measures prescribed and the implementation of the plan.

## 1.1 Limitations of this plan

This plan has been written using the most up to date data and guidance to propose a number of specific management actions to maintain and restore the Natura 2000 sites and enhance overall biodiversity. This management plan did not exclude management actions due to limitations such as cost or ownership, and it based on an idealised scenario. The limitations that may delay or prevent the management implementation are listed below:

- **Finances:** The required finances to implement the plan in full are currently not available. Funding will be allocated based on prioritisation of management actions.
- **Land ownership:** Most of the lands within the SAC and SPA are privately owned. All management actions have to be discussed and agreed with the relevant landowners.

- **Resources:** The implementation of management actions is dependent on having access to the right equipment, livestock and livestock managers. ..
- **Access restrictions:** Some parts of Howth are difficult to access with machinery due to the steepness and rocky nature of the terrain. The approach to the management actions has to take this restriction into account. For example, specialist climbers or drones will be needed to manage the invasive species on the steep sea cliffs where machinery access is not possible.
- **Bird nesting season:** Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).
- **Timescale of this plan:** The plan is written in such a way that it can be used in perpetuity due to the long timescales for recovery and ongoing management required particular for the dry heath habitat. However, a review of the plan every five years is recommended due to new guidance or data being made available over time.

# 2. VISION STATEMENT

Howth Head is known for its imposing sea cliffs, rugged heath, and lively bird colonies along with species rich grasslands, hidden beaches and woodlands . These biodiversity rich landscapes are uniquely integrated into the urban fabric of the town of Howth and are visited and enjoyed by numerous visitors from the local area and further afield. The area provides spectacular views and is used extensively by walkers, cyclists, golfers and other recreational users. It has a long history of human habitation and supports a wealth of ecological, archaeological and cultural heritage and is designated under a Special Amenity Area Order.

The landscape and habitats associated with Howth Head have been created through many centuries of human activity. Pollen data indicates that Howth head supported a mosaic vegetation of heathland, forest, grasslands, wetlands and scrub between 1400 and 1994 (Cooney, 1994). The iconic and protected heathlands were created and maintained by agriculture in times past but are now declining in extent and quality as the grazing they once supported no longer represents an economically viable activity.

*Plate 2-1 Old Irish goats being milked on Howth Head, photo from circa 1950. Photo provided by Fingal County Council.*

After agricultural activities disappeared from Howth in the 1950's, , heathlands have been encroached upon by Bracken, Gorse and woodland. Whilst this could be regarded as natural succession and may result in an increase in overall biodiversity, it does result in the reduction of the heatland habitat that is synonymous with Howth Head and legally protected as part of the Howth Head SAC. In addition, the lack of management of heathland has led to an increased wildfire risk due to an increase in woody material both on the heath and in some of the encroaching scrub (gorse and bracken). Uncontrolled wildfire has a detrimental effect on both the quality of the remaining heath and the surrounding urban areas.

Howth Head is used extensively for recreation and if not carefully managed, this can lead to detrimental effects on the most important habitats and species on Howth Head through trampling, disturbance, littering and increased risk of fire starting.

The overall vision for Howth Head is set out below:

'*to protect, maintain and enhance the iconic habitats and species that are synonymous with Howth Head, to optimise biodiversity and to ensure that access for public enjoyment is maintained in perpetuity.*'

The overarching principles that will guide the management of Howth Head SAC and Howth Head Coast SPA to achieve this vision are set out below:

- To maintain and restore the favourable conservation status of the iconic and habitats and species for which the SAC and SPA are designated.
- To protect the SAC, SPA and surrounding areas from wildfire.
- To optimise the overall biodiversity value of the SAC and SPA.
- To sustainably enhance and regulate recreational activity for the continued enjoyment of the natural environment at Howth Head by the general public into the future.

# 3. METHODOLOGY

This chapter concisely sets out the methodology followed in the design and preparation of this management plan.

## 3.1 Initial Desk Study and Preparation

The first step in the preparation of this management plan was to undertake a thorough review of the available information pertaining to the SAC and SPA including the Conservation Objectives Documents, Natura 2000 Standard Data Forms and other information specific to the Designated Sites.

Following this, other relevant information in respect of the area was reviewed. Much of this information comprised of ecological, cultural and heritage reports that had been commissioned by the Howth Special Amenity Area Order (SAAO) committee. Many of these reports contain valuable information and recommendations in relation to the management of Howth Head including detailed surveys of the heath areas, sea cliffs and breeding birds for which the SAC and SPA are designated. The information, recommendations and advice provided in these reports was considered and where possible, adopted in this management plan. A non-exhaustive list of information reviewed is provided below:

- Howth Peninsula Fire Management Strategy (Gibson, Castellou and Tubridy, 2021);
- Howth SAAO Design Guidelines (Fingal County Council, no date a);
- Howth SAAO Communication Plan 2023-2025 (Fingal County Council, 2023);
- Howth Special Amenity Order Operational Plan 2021-2025 (Fingal County Council, 2021);
- Wetland Study Phase 1 Howth, County Dublin (Scott Cawley, 2021);
- Howth Special Amenity Area Order (Fingal County Council, 1999);
- Howth SAAO Factsheet and Leaflet (Fingal County Council, no date b);
- Protecting Howth's Habitats (Declan Doogue, no date);
- Draft Howth Heathland Management Plan (Tubridy, 2015);
- Invasive species mapping, Howth, Co. Dublin (Dhúill and Smyth, 2018);
- Howth Head Breeding Bird Surveys 2018 (Natura Consultants, 2018);
- Heathland Study, Howth Head, Co. Dublin (Perrin and Barron, 2020) by BEC Consultants, herein after referred to as 'heathland study');
- Cultural Heritage Study Redrock/ Sutton Castle (CRDS Ltd., 2019);
- Common Lizard, *Zootoca vivipara* (Lichtenstein, 1823), Survey of Howth (Herpetological Society of Ireland, 2019);
- Spiders of Howth (Myles Nolan, 2020);
- Flora Study of Redrock (Brady, 2018);
- Howth Ground Beetle Survey 2019 (Nessa Darcy, 2020)
- Howth and Ireland's eye Bryophyte Survey (Denyer and Hodd, 2019)
- Condition Assessment of Trees within the Woodland at 'Red Rock', Sutton, Dublin 13. (Arborist Associates Ltd., 2023);
- Redrock Management Plan 2020- 2030 (Jolliffe-Byrne and Visser, 2020);
- Howth Head SAC – Draft Management Plan (Unpublished, National Parks and Wildlife Service, 2005).

In addition to the above, two visits were made to Howth Head during the early stages of the preparation of the Management Plan. The first visit was undertaken by MKO staff and served to provide a general orientation in advance of plan preparation, The second visit involved the same MKO staff meeting representatives from Fingal County Council Biodiversity team, the National Parks and Wildlife Service, and Faith Wilson Ecological Consultants to consider the issues to be addressed in the plan and to discuss the priorities of the various stakeholders. A public meeting was held in Howth Head Yacht Club to discuss a draft plan, which was followed by a virtual consultation with the NPWS.

## 3.2 Mapping

Following on from the desk study described above, a mapping exercise was undertaken to:

1. Collate all available ecological records and display them spatially on a map;
2. Provide all available detail on the extent of habitats on the site at the present time;
3. Provide a basemap from prior to the designation of the SAC to estimate habitat composition at that time (Aerial photography from 1996);
4. Provide LiDAR elevation data to allow consideration of potential management options and likely success of habitat creation (Office of Public Works, 2011).

## 3.3 Identification and Prioritisation of Management Objectives and Actions

Having undertaken the detailed desk study and mapping exercise, the next step was to identify high level management objectives that align with the overall vision and overarching principles as set out in Section Two of this report. Any management objectives would also need to fully align with the statutory requirements of the EU Habitats Directive (European Council, 1992).

Once the high-level management objectives had been identified, a further mapping exercise was undertaken to determine the locations where actions are required in order to meet those objectives.

Following this, an exercise was undertaken to set out the most appropriate management actions in each area. This exercise involved the compilation of many of the recommendations made in the various reports commissioned by the SAAO committee and also following a review of national and international best practice ((Perrin *et al.*, 2014; Heathland Habitat Group, 2016; Bundesamt für Naturschutz (BfN) und Bund-Länder-Arbeitskreis (BLAK) FFH-Monitoring und Berichtspflicht (Hrsg.), 2017; European Commission, 2020; Niedersächsischer Landesbetrieb für Wasserwirtschaft, 2022).

The next step was to prioritise the high-level objectives to determine which management actions would take precedence. Similarly, individual actions were prioritised such that clear guidance is provided on what actions should be undertaken if resources are limited.

In the final step, Howth Head was divided up into six management areas and clear recommendations for management of each area are provided. The area of Redrock had a management plan prepared previously and is therefore excluded in Section 6 (detailed management plans). Actions are prioritised and shown on accompanying maps. The management areas are shown on Figure 3.1 and listed below.

- Nose of Howth;
- East Mountain;
- The Summit;
- The Baily, Glenaveena and Bellingham's Farm;
- Shielmartin;
- Ben of Howth.


Map Legend

Howth Head SAC and Howth Head Coast SPA



Drawing Title: Management Areas

Project Title: Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 3-1 |
| Scale | Date |
| 1:12,000 | 2025-01-23 |

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# 4. MANAGEMENT PLAN OBJECTIVES AND PRIORITIES

The high-level objectives of this plan that have been identified as integral to the achievement of the overall vision for Howth Head and the Statutory Requirements under the EU Habitats and Birds Directive and are listed in order of priority below (European Council, 1992, 2009). The rationale for their respective priority and details of the general management strategies are provided in the following sections.

1. **Conservation and restoration of habitats and species for which the SAC and SPA are designated**
    a. Protection from Wildfires
    b. Maintain and restore the favourable conservation status of the Qualifying Interests habitats and species (QIs)
    c. Public Access Management
2. **Other Biodiversity Enhancements**

## 4.1 Conservation and restoration of habitats and species for which the SAC and SPA are designated

### 4.1.1 Protection From Wildfire

This objective is the main priority for the management of Howth Head as without such protection the area is highly vulnerable to uncontrolled wildfire, which can (and has) led to extensive damage to the habitats and species on Howth Head (Gibson, Castellou and Tubridy, 2021). Uncontrolled fire also has the potential to result in extensive damage to property and infrastructure on Howth and the smoke plume can interfere with the flightlines into Dublin airport.

The Dry heath habitat in combination with Gorse scrub and Bracken stands create a highly flammable landscape. In Ireland and the UK, fire has been used traditionally in upland management by means of small controlled burns to rejuvenate heather growth to improve the land for grazing. However, the limited amount of charcoal within the local pollen records prior to the 1950's seems to suggest that this was not common practice on Howth (Cooney 1994). Furthermore, controlled burns are not recommended for Howth due to the significant risk posed by fire to residential property in the vicinity of the heatland. Fire may also cause erosion of the already very thin layer (2-3cm) of peaty soil that supports the Dry Heath habitat, because it exposes the soil on steep slopes to wind and rain following a burn. (Tubridy, 2015; NPWS, 2016). Large wildfires in the past have reduced the spatial and structural diversity within the heathland on Howth by removing heather growth over large areas, thereby creating large uniform stands of heather following vegetation recovery.

This objective was assigned highest priority because:

- The maintenance and restoration of the dry heath habitat, for the protection of which Howth Head has been designated as an SAC has the potential to be significantly compromised by uncontrolled wildfire;
- Heath on Howth could be irreversibly damaged by uncontrolled fires through loss of soil, seedbank and mature heather stands and opens ground to be colonised by fast growing species such as gorse, and bracken instead of heather;

- Fires can also be damaging to ground breeding birds and endanger the birds for which the SPA is designated through smoke or fire spread;
- Uncontrolled wildfires pose a significant threat to property and infrastructure;
- Uncontrolled wildfires pose a significant threat to overall biodiversity.

A Wildfire Management Strategy was prepared to pro-actively address the risk of wildfire on Howth (Gibson, Castellou and Tubridy, 2021). The following recommendations are set out in the wildfire management strategy

- Establish a Howth Wildfire Group;
- Organise Wildfire training for Wildfire group and Dublin Fire brigade (DFB);
- Develop Operational Wildfire plan for Howth with DFB;
- Manage vegetation at Strategic Management Areas (wildfire breaks) by removing tall Gorse and keeping all vegetation below 30cm;
- Include a wildfire risk assessment in planning applications;
- Carry out a study on developing suitable access to water supply for DFB at East Mountain, Green Hollows and Bellinghams Farm.

The development of wildfire breaks is the most relevant actions in terms of landscape management. The purpose of the wildfire breaks is to cut the wider landscape into smaller pockets to prevent large scale wildfires. The short vegetation within the wildfire breaks allows the Fire Brigade to wait until the fire reaches the wildfire break and the fire can then easily be controlled with beaters and backpack sprayers. This approach makes a wildfire easier to manage and requires less manpower and equipment.

Fingal County Council commenced the development of the wildfire breaks in 2021 and most of the wildfire breaks have now been put in place. An example of a wildfire break near residential property is shown in Plate 4-1 below. The Wildfire Management Strategy recommends the following method for creating wildfire breaks:

- The removal of common Gorse *U. europeaus* outside the bird nesting season, with the dimensions of firebreak dependent on the height of the vegetation adjacent to the firebreak. The practical guideline is that the width of the wildfire break is ten times height of vegetation e.g. if the surrounding vegetation is 3m high then the wildfire break should be 30m wide;
- Cuttings should be immediately removed from site;
- Where common Gorse is dominating, plants could be totally removed instead of cutting as it is expected that revegetation will occur naturally and management of the area would involve keeping the vegetation height low due to cutting or grazing;
- No cutting of autumn Gorse (*U. galli*) and heathers, as they are associated with the QI habitat.

*Plate 4-1 Example of Firebreaks maintained near residential properties on Howth*

The wildfire breaks are currently maintained by means of a goat grazing scheme at Redrock, Shielmartin and Ben of Howth due to the steep and stoney terrain conditions. The wildfire breaks on East Mountain are currently maintained mechanically with a tractor and flail collector and all arisings are disposed off-site.

The Wildfire Management Strategy also recommends reducing the fire load in the wider heathland landscape, with a particular focus on the removal of easily flammable vegetation such as Gorse and Bracken, (Gorse is particularly flammable due to the high oil content in the plant). While Bracken and Gorse are a natural component of the Dry Heath habitat, the heathland report also proposes to reduce the proportion of dense Bracken and Gorse scrub within the heathland landscape from 36% (91.28 ha) to 20% (51 ha) or less by conversion to Dry Heath, grassland or woodland to improve the overall conservation status of the SAC.

Most of the firebreaks created so far have been located in areas dominated by European gorse, thereby removing significant areas of gorse to date. Further gorse removal work is proposed on the lower slopes of Shielmartin, between Redrock and the Carrickbrack road, and along the upper cliff pathway and near the summit car park at East Mountain. Large uniform stands of mature 2-4 m high gorse are to be targeted in particular as these stands provide a significant fuel resource.

On the south side of Shielmartin, it is proposed to experiment with the use of broadleaf woodland planting as a natural firebreak. The use of deciduous woodland as a fire break has been applied elsewhere in the world. (Alberta government, 2012; Aline et al, 2023; Xanthopoulos, Calfapietra and Fernandes, 2012; European Commission, 2020; Marshall et al., 2024; Piazza et al., 2024). Locally, it was observed that the wildfire on the Ben of Howth in 2013 burned many of the individual trees on the heathland, while the trees and the understorey in the developing birch forest on the northern flank of Dun Hill did not burn.

The area proposed for experimental woodland firebreak planting is covered by a dense stand of Bracken and coincides with likely deeper and more fertile soils. The proposed planting comprises of deciduous species only, such as sessile oak (*Quercus petraea*), rowan (*Sorbus aucuparia*), birch (*Betula* sp.), hazel (*Corylus avellana*), holly (*Ilex aquifolium*) and hawthorn (*Crataegus monogyna*) that would be planted in a 1.5 m x 1.5 m – 2 m x 2 m grid. The aim is to create a linear woodland with a closed canopy. It is anticipated that the shady conditions should prevent any significant understorey vegetation developing, thereby depriving a wildfire from fuel. Furthermore, the deciduous trees themselves have been shown to exhibit relatively low flammability in previous studies elsewhere (Alberta Government,

2012, Tree Canada, 2019). The vegetation around the trees in the firebreak will have to be managed with livestock or machinery to keep the bracken down to ensure suitable access for the fire brigade to the area until the tree canopy closes. It is envisaged that the abundance and volume of ground cover vegetation will decline once the canopy closes, while still providing access for the fire brigade. Bracken management within the fire break will also benefit the young saplings, as it can be very difficult to establish trees in dense Bracken stands (Fera, 2024).

Future management of the wooded firebreak will have to include the removal of dead and dying trees to ensure that no new fuel is added to the fire break. Any tree seedlings spreading in the adjoining heathland from the fire break can be eliminated through goat grazing or manual removal, thereby preventing any deterioration of the adjoining Dry Heath habitat.

his management plan recommends the enhancement and re-establishment of wetlands to function as firebreaks (as shown on Figure 4.1 below). Wetlands with wider areas of open water are most likely to act as firebreaks as the expanse of water makes it harder for the fire to jump across.

*Plate 4-2 Previous gorse fires have threatened dwellings on Howth (provided by Fingal County Council)*

## Map Legend

Howth Head SAC and Howth Head Coast SPA

Fire Management

- Fire and Fuelbreaks
- Natural Wetland Firebreak
- Woodland Firebreaks

N



Drawing Title

Fire Management Actions

Project Title

Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
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| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 4-1 |
| Scale | Date |
| 1:10,000 | 2025-01-23 |

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### 4.1.2 Maintain and restore the favourable Conservation status of the QIs

The SAC and the SPA both have Conservation Objectives that pertain to the habitats and species for the protection of which the sites are designated (Qualifying Interests or QIs). These objectives are statutory requirements of the EU Habitats Directive (92/43/EEC) and EU Birds Directive (09/147/EC), pertaining to the SAC and SPA respectively. The QI habitats are listed below and their location shown in Figure 4-2 and discussed in detail in the following sections.

**Howth Head SAC (000202)**

- European dry heaths [4030]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]

**Howth Head Coast SPA (004113)**

- Kittiwake (*Rissa tridactyla*) [A188]

## Map Legend

Howth Head SAC and Howth Head Coast SPA

Qualifying Interests

- European dry Heaths [4030]
- Vegetated Sea Cliffs of the Atlantic and Baltic Coasts [1230]
- SPA Seabird colony (incl. Kittiwake) susceptible to human access



N

Drawing Title
Qualifying Interests of Natura 2000 Sites on Howth

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PT |
| Project No. | Drawing No. |
| 240413 | Figure 4-2 |
| Scale | Date |
| 1:11,000 | 2025-01-20 |

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### 4.1.2.1 European dry Heaths [4030]

The Dry Heath habitat on Howth Head extends to approximately 86 ha within the SAC, with an additional 5 hectares outside the SAC, according to the heathland study. This area is similar to that recorded by the NPWS (80.33 ha), but is considerably less than the 131.2 ha stated on the Natura 2000 standard data form updated in 2017.. The main areas where Dry Heath occurs are on the summit the northern part of Shielmartin, the Ben of Howth, the Nose of Howth and in patches along East Mountain.(Perrin and Barron, 2020) Aerial photography from 1996 was used to estimate the extent of heath at the time of designation of the SAC (May 1998) and this was compared with the known extent of heath recorded in 2019 during a detailed survey of the heathland on Howth Head. This showed that approx. 13.3 ha of heathland have been lost in the intervening period. Comparative Areas are shown in Figure 4.3 (p.20).

The major threats to heathlands on Howth have been identified in previous reports as:

- Wildfires;
- Scrub encroachment by Bracken, Gorse and Birch;
- Invasive species including *Rhododendron ponticum*, Canadian fleabane (*Conyza canadensis*) and the moss *Campylopus introflexus;*
- Trampling by visitors;
- Nitrogen deposition in both soils (from Gorse and bracken growth) and, potentially, air;

Figure 4-4 (p.21) shows the indicative locations of the major identified threats to dry heath habitat on Howth Head. This was derived from notes taken during the various surveys of the heathland and through observation during the site visits undertaken in the preparation of this report. It should be noted that it is indicative and non-comprehensive.

The heathland study classified the heathlands by their quality (Good, Moderate or Poor). This information has been used to visually show the condition of the heath habitat on Howth Head and the surrounding/encroaching Scrub and bracken habitats (Perrin and Barron, 2020). This is shown on Figure 4-5 (p.22) below with information updated to reflect recent changes in quality resulting from fire (Shielmartin) and to show the areas that were likely to have been heathland in 1996 but were not recorded in the heathland study. Areas of Scrub that BEC classified as ‘Dense Bracken’ (Fossitt Code HD1, Julie A. Fossitt, 2000) or a mosaic including ‘dense bracken’ are set apart from other Scrub in the map below. Additionally, areas of grassland where ‘dense bracken’ was recorded is also shown.

Management of heath shown on maps is indicative only from data from 2019 (Perrin and Barron, 2020).

Detailed management decisions are to be made following a site visit and up to date condition assessment in advance of any scheduled management, given that the condition of the habitats will vary over time.

## Map Legend

- Howth Head SAC and Howth Head Coast SPA
- Dry Heath recorded in 2019
- Dry Heath lost since 1996



N

Drawing Title
Estimated Loss of dry Heath since 1996

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 4-3 |
| Scale | Date |
| 1:11,000 | 2025-01-20 |

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## Map Legend

- Howth Head SAC and Howth Head Coast SPA

Indicative Threat

- Bare Ground
- Composition
- Composition and bare Ground
- Composition and Heather beetle
- Composition and Scrub Encroachment
- Grass Encroachment
- Scrub
- Scrub and bare Ground
- Scrub and Grass Encroachment
- Scrub and Invasive Plant Species
- Bare Ground and Invasives
- Quarrying
- Unknown



N

Drawing Title
Indicative Map of Threats for dry Heath on Howth

Project Title
Howth Head Coast SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PT |
| Project No. | Drawing No. |
| 240413 | Figure 4-4 |
| Scale | Date |
| 1:11,000 | 2025-01-20 |

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## Map Legend

Howth Head SAC and Howth Head Coast SPA

Dry Heath Quality

- Good
- Moderate
- Poor
- Heath likely lost since 1996

Indicative Scrub Categorisation

- Bracken-dominated Scrub
- Bracken-dominated Grassland
- Mixed Scrub



Drawing Title
Howth Head Heath Quality and Extent of Scrub

Project Title
Howth Head SAC and SPA Management Plan

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| MT | PT |
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| 240413 | Figure 4-5 |
| Scale | Date |
| 1:11,000 | 2025-01-23 |

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The management recommendations are specifically designed to maintain the habitat in favourable conservation status where it currently exists in that state and to restore those areas of heath that are not in favourable status (including the areas that are likely to have been heath at the time of designation). This is fully in line with the Conservation Objectives for the SAC (NPWS, 2016), listed in Appendix 1. It should be noted that the Conservation Objectives for Howth Head SAC (NPWS 2016) currently give the overall conservation objective for Dry Heath as 'maintain the favourable condition'. However, based on the assessment by Perrin and Barron, 2020, the overall objective should be changed to 'restore the favourable condition'. The implication is that active management is required to address the factors that are contributing to this unfavourable conservation condition rather than a situation of maintaining the status quo. The site-specific Conservation Objectives for the SAC set out attributes and targets for the maintenance of favourable conservation condition of the heathland. The targets and attributes relating to vegetative diversity and composition are based on criteria set out in Perrin et al (2014).

The Dry Heath management techniques recommended in this plan are based on the European Commission's 2020 '*Action plan to maintain and restore to favourable conservation status of the habitat type 4030 European Dry Heaths*', the *Howth Heathland Management Plan* and the heathland study (Tubridy, 2015; European Commission, 2020; Perrin and Barron, 2020).

The timespan and likelihood of success of management techniques is described in the '*Restoration of Existing Lowland Heathland – Timescales to achieve Favourable Condition'* by Plantlife (Shellwell *et al.*, 2016).

The management activities for dry heath are prioritised as follows:

1. To maintain the extent and quality of Dry Heath Habitat that is in good condition (as shown on Figure 4-3, p.20);
2. Manage of areas of heathland that have recently burned and are in danger of regenerating with scrub;
3. Manage heathland areas that are in moderate and poor condition;
4. Restore heathland in areas that were likely to have previously been heath at the time of designation and have been lost due to lack of appropriate management;

#### 4.1.2.1.1 Management Actions for Enhancement of Dry Heath

Howth Head is SAC is designated for dry heath habitat. The dry heath habitat on Howth has formed through agricultural practices such as goat grazing and fire management. Due to changes in land use away from traditional agricultural practices, the dry heath has since deteriorated in habitat quality. The heathland study undertook a quality and condition assessment of the dry heath on Howth. Across the site the dry heath habitat was categorised as Unfavourable- bad in its structure and function assessment. There is therefore a need to improve the structure of the dry heath on Howth.(Perrin and Barron, 2020) The priority is in a first instance to preserve and enhance dry heath habitat that is still in good condition. The objective behind these measures is to prevent the loss of Dry Heath habitat (conversion from heathland to woodland or scrub), create a structurally more diverse heathland habitat and prevent further deterioration due to trampling, tree establishment and invasive species.

##### Preventing Scrub and tree Encroachment

All of the following management measures are to be first undertaken for the good quality heath, where applicable, and ultimately expanded onto the moderate and poor-quality heath. Targeted scrub and tree removal should be undertaken within areas of good quality dry heath to prevent further loss of same. This can be achieved through mechanical removal or grazing or a combination of both. Progress will be measured by monitoring managed areas against the proposed targets set out in the Site

Conservation Objectives as per the heathland study. The Conservation Objectives set out that cover of scattered native trees and shrubs is to be less than 20% and cover of bracken (*Pteridium aquilinum*) to be less than 10% at any one monitoring stop.

Grazing would be undertaken in specific locations as follows:

- According to the goat grazing study undertaken on Howth Head, recommendations for grazing heathland vary from 1 ewe or goat to 0.25-2 hectares, 1 cow to 2-8 hectares and 1 pony to 5-12 hectares.(Old Irish Goat Society, 2018)
- Goats are successfully being used for grazing scrub on Howth; and would be suitable to graze the mature Gorse and Bracken stands and which can be combined with grazing good quality dry heath to add to the structural diversity of the heathland. There is also potential for experimental grazing with other livestock such as ponies and cattle to prevent encroachment by scrub and maintain the dry heath. .
- Monitoring of heathland against the conservation objectives is to be undertaken in conjunction with grazing to ascertain effectiveness.
- To remove birch sapling, goats can be used from April onwards to graze the saplings (Lake, Bullock and Hartley, 2001).

Cutting to prevent scrub encroachment may be undertaken as follows:

- Targeted removal of scrub within the good heath habitat will be undertaken to prevent scrub encroachment. Methods may include manual removal with hand tools or mechanical removal, following a site-specific condition assessment to avoid impacts on sensitive heathland habitats.
- All Gorse and Bracken cuttings are to be removed from the site where they are not used for heath rehabilitation (Tubridy, 2015; Perrin and Barron, 2020).

## Invasive Species Management

A number of Invasive Plant Alien Species (IAPS), with a focus on those listed under the First Schedule of the European Communities Regulations 2024 (S.I. No. 374/2024 superseding S.I. 477 of 2011), were found within the SAC, the largest threat coming from the IAPS *Rhododendron ponticum*.

Meaningful progress has been made in removing *R. ponticum* from the Dry Heath habitat on Howth, with a Rhododendron removal programme ongoing for more than 15 years ((Perrin and Barron, 2020) pers. Comment. Hans Visser).

*R. ponticum* is removed either through cutting & stump treatment with herbicides, pulling and shredding, or bark stripping and herbicide application on younger plants or regrowth. This is ongoing on Howth and the removal strategy used depends on the local conditions (pers. Com. Hans Visser).

This management plan recommends:

- Continue with the existing removal of *R. ponticum* until the plant is eradicated from the heathland;
- Raise public awareness of the risks posed by the spread of invasive species through signage and as per the visitor strategies set out in the previous section. (Dhúill and Smyth, 2018; Perrin and Barron, 2020). Fingal County Council is coordinating a number of ongoing experimental trials to find most suitable management technique for Rhododendron eradication. These trials should continue, and successful methods used on Howth and any learnings applied to the overall strategy.

The invasive moss *Campylopus introflexus*, which is not listed in the first schedule of the 2024 Regulations, also grows throughout the site, is the most frequent invasive species recorded within Dry Heath in Ireland (Perrin *et al.*, 2014). However, if it doesn't form particularly dense mats that would suppress heather growth, it is not considered to have long term effects on biodiversity ((European Commission, 2020).

Any invasion of other First Schedule and Non-First Schedule Invasives such as Canadian fleabane (*Conyza canadensis)* should be monitored.

### Reducing the impact of trampling

While most of the half a million visitors to the heathland stick to the signposted looped pathways, some use the network of informal paths located within the heathland habitat. Howth has also become increasingly popular with mountain bikers that use the informal tracks, particularly around the Ben of Howth. These informal pathways are not subject to any maintenance operations, and the repeated use is eroding away the soil layer and sometimes the loose rocky subsoil underneath. Erosion from trampling and cycling is evident at many places along the upper and lower cliff walks, including Nose of Howth, the viewing area northeast of the Summit car park, and on the paths south-east of the Summit car park. There are additional paths leading to the summit of Dun Hill from the north-west and around the aerials on the Ben of Howth. Fires expose the underlying soil to erosion due to rainfall and wind, and also open up areas to trampling, which in turn impedes vegetation recovery (for example on East Mountain).

The following actions will be undertaken in areas where trampling is identified as a threat to the Dry Heath habitat:

1. Maintain the signposted looped pathway network in good condition to encourage use of these paths and discourage uncontrolled access to the wider area and habitats. Consider formalising some of the existing ad-hoc paths/viewpoints to control access in areas where people want to visit – rather than to prevent access completely.
2. Construct low level fencing to discourage the use of existing ad-hoc paths and allow for natural recovery of heather where a layer of peat is still present on top of the bedrock.
3. Undertake heather rehabilitation works where the oil profile has completely been worn away by recreational traffic, including replanting of heath habitat using local heath cuttings or locally grown plants (Shellwell *et al.*, 2016).
4. In areas where management or restoration is being undertaken, signage should be considered so that the general public are aware of the sensitivity of the habitats/species in the area and the works that are being undertaken to preserve them. Similarly a programme of walks, talks and biodiversity events could be considered to highlight biodiversity on Howth Head (Perrin and Barron, 2020).

### Creation of a diverse (Age) Structure

The creation of a diverse structure is coupled to the regenerative growth ability of plants to grow back after a management intervention. The creation of an age structure has a multitude of benefits:

- The Conservation objectives set out targets of heather composition to enhance resilience and regenerative capabilities of the habitat (particular for regeneration after fire) such as
  - Senescent proportion of ling (Calluna vulgaris) cover less than 50%
  - Outside sensitive areas, all growth phases of ling (Calluna vulgaris) should occur throughout, with at least 10% of cover in the mature phase
  - Cover of disturbed bare ground less than 10%
- Age structure will enhance structural diversity and break up dense canopy cover, where new heather plants and a bryophyte layer can establish to fill the gap.

- Improving structural diversity will further be beneficial for overall biodiversity, particularly for invertebrates and bryophytes.

Schellenberger et al. discuss in detail the limited regenerative capabilities of older plants and therefore recommend that intense management be limited to young plants with high resprouting capacity (plants less than 15 years old) (2022).

Two options are recommended to create a diverse age structure on heath. The first, and preferred option, is grazing to recreate the agricultural conditions that created the dry heath habitat in the first place. This would include:

- Grazing at a low stocking density with traditional livestock as described above.
- Monitoring changes in the heath structure and composition following the onset of grazing.

Alternatively, where grazing is not possible (initially), cutting has been used elsewhere to enhance the age structure. Whilst this option would require some experimentation to ensure its success, there are number of requirements for cutting good dry heath that will apply:

- Both grazing and cutting is to be undertaken rotationally so that 90% of mature heath area has been either cut or grazed within a 25-year cycle. (NPWS, 2016)
- Heath plants are to be cut back in small irregular patches (1,62 ha in total per year, see Appendix 2) in rotation over 25 years, with at least 10% of mature heath present throughout (NPWS, 2016). The patches are to be monitored to ensure no scrub or grass encroachment takes place and need to be small enough that adjacent mature plants can reproduce vegetatively and reach into the open patch to regenerate (Schellenberg and Bergmeier, 2022).
- Experimental trials are required to determine:
    - The optimum height of the cut depending on the age of the heather. Cutting at ground level to 5cm for plants aged 7-14 years and clipping the tips on plants outside the 7-14 age bracket. (Miller and Miles, 1970; Schellenberg and Bergmeier, 2022; Moody and Holden, 2023)
    - The requirement to remove cut material – the removal reduces the risk of wildfires and prevents the brash from smothering the regrowth and soil enrichment, but is costly. The alternative use of the brash in the locality (in its original form or chipped) is to be explored in more detail too to reduce the overall costs of this measure
    - The optimum time of year to cut the heath as per (Miller and Miles, 1970; Moody and Holden, 2023)
        - Cut in March to April for early regrowth, in line
        - Cut in September to October and leave cuts and monitor for establishment of new young plants from brash mats of cut heather.
    - The size of patches to be cut to regenerate heather will be site specific and the subject of ongoing monitoring. To start, indicative sizes may range from 10 $m^2$ to 100$m^2$.
    - Whether heath rehabilitation through sowing or planting with new young plants is necessary in mature heath.

Expected timescales for recovery are taken from Shellwell et al (2016) and are as follows:

- It can take at least 1-3 years for heather to regenerate after cutting mature heather with a closed canopy but may take up to 4-6 years;
- Regeneration from building-stage rootstock and mature heather can occur within six months in favourable conditions, but usually over 1-2 years. Regeneration from degenerate heather rootstock is variable – quick regeneration may occur within one year or there may be no regeneration at all;

- Regrowth from building-stage heather stools can occur within three years, and from mature or degenerate heather stools takes more than five years (and is more dependent on seedling establishment for recovery);
- Regeneration from the soil seed bank may occur within 1-4 years but can take up to six years;
- Aspect influences heather regeneration with south-facing slopes quicker to regenerate within1-2 years, compared with north-facing slopes that may take over five years;
- Free-draining nutrient-poor soils may develop heather in year one, which is likely to become dominant over time. Browner, less free-draining and slightly more nutrient-rich soils may develop bramble, and additional scrub management may be required such as cutting and removing vegetation twice a year.
- Habitat deterioration in the form of trampling leading to bare ground;

## Restoring heathland

Natural succession has taken place in various locations on the heathland in Howth since 1998 when the Howth Head SAC was designated. Aerial photography from 1996 was used to estimate the extent of heath at the time of designation of the SAC (May 1998) and this was compared with the known extent of heath recorded in 2019 during a detailed survey of the heathland on Howth Head. This showed that approx. 13.3 ha of heathland have been lost in the intervening period. Comparative Areas are shown in Figure 4.3 (p.20). In these areas Gorse, Bracken and trees have taken over the Dry Heath.

Ideally, the heathland would be restored where it has been lost since 1998. This is not a straightforward task however, as the Bracken and Gorse can enrich the ground and thereby changing the soil chemistry and composition permanently. Just removing the Gorse and the Bracken may not be enough. An example where scrub was removed along the Upper Cliff Road, and heather did not regrow, is shown in Plate 4-3. Instead, bracken and grass reappeared, indicating high soil nutrient levels.

*Plate 4-3 Mosaic of gorse, bracken and grasses growing after gorse was cleared near the upper cliff road. No heather regrowth recorded.*

In circumstances where heathland is not re-establishing following initial management of scrub clearance and following 2-3 years of grazing/cutting management (Shellwell *et al.*, 2016) heathland rehabilitation management should be considered. Heathland rehabilitation will ultimately be dependent on the ground conditions on site and underlying factors such as soil pH, nutrient level, and baseline vegetation.

Both Gorse and bracken enrich nitrogen in the soil, and re-establishing heath in nutrient rich soil will be difficult.(Snow and Marrs, 1997; Bardon *et al.*, 2018; Galappaththi, de Silva and Clavijo Mccormick, 2023) There are several experimental trials that would be useful to guide heathland rehabilitation management on Howth. Some options for experimental trials have been set out below.

- Test for Soil depth, chemical makeup and composition survey in good quality heath with active regrowth to determine optimum soil parameters for dry heath as these are currently unknown (Perrin *et al.*, 2014; Perrin and Barron, 2020). Niemeyer et al (2005) recommends testing for the following parameters total and available phosphorus, nitrates, nitrites and ammonia, magnesium and potassium;
- Test for nitrogen deposition from air(Aherne, Wilkins and Cathart, 2016; Air Pollution Information System, 2025);
- Where gorse and bracken has been established for a long time, soil & leaflitter removal should be trialled at different depths to remove additional nutrients.(Niedersächsischer Landesbetrieb für Wasserwirtschaft, 2022). Sod cutting removes the upper, nutrient rich layer of soil, but this technique risks removing an existing soil bank as well (Graaf *et al.*, 1998); The excavation of the enriched layer can be combined with sowing heather seed or placing (seed rich) heather brush on the ground to bring in the necessary heather seed source. It should be noted that it is not advised to remove the topsoil on the steeper slopes as that may cause soil erosion during periods of heavy rainfall.
- Grazing where gorse has been cleared and grasses come back to test whether heath will re-establish; Trials such as livestock type, grazing density and timing will be undertaken.
- Consider trialling to stimulate germination in heather seed using smoke water. Smoke water is a liquid containing chemicals that are associated with wildfires. Soaking or spraying on heath plants has been shown to kick start seed germination.(The Seed Collection, 2020)
- Pioneer heath should be establishing on bare ground in two to three years, and in the case of successful rehabilitation, characteristic heathland cover should be achieved within four to eight years. Where dry heath is not reestablishing within this timescale, the abiotic conditions may not suit the heath plant where scrub encroachment is not an issue. Further soil testing may be required to determine cause of any failed rehabilitation.

Options for heathland rehabilitation management would involve either the spreading of heather brash to provide a seed bank that may have been lost, or growing heath from seeds from local heather populations, and in their pioneer stage plant them onto bare ground. Fingal County Council is currently growing approximately 20,000 heather plants from local cuttings in greenhouses. Following the regrowth of small heather plants, it is crucial to avoid encroachment by scrub and grass that would outcompete the young plants. The best option to avoid encroachment is to establish continued grazing to control grasses, bracken or scrub from invading. Continued monitoring is then crucial to ensure establishment.

It is proposed to trial the restoration of heather from Bracken at Shielmartin, while the conversion trial from Gorse to heather is proposed to take place on East Mountain.

#### 4.1.2.1.2 Monitoring

The conservation status of the Dry Heath Habitat on Howth Head should be monitored on an ongoing basis, and reviewed in five year intervals, and appropriate management employed according to the recorded status and threats identified. Timescales for Monitoring and at which stage management interventions may be needed are provided in the preceding sections and also clearly set out by Shellwell et al. (2016). The quality and status of the Dry Heath habitat on Howth Head should be assessed using the '*Guidelines for a national survey and conservation assessment of upland vegetation and habitat in Ireland Version 2.0*', Irish wildlife manual No.79 by the Department of Arts, Heritage and the Gaeltacht (2014).

#### 4.1.2.2 Vegetated Sea Cliffs

The vegetated sea cliffs within the Howth Head SAC are shown on Figure 4-2 (p.18). They were surveyed in detail in a dedicated Vegetated Sea Cliffs Survey of Howth Head (Fitzgerald Ecology, 2023). The associated survey report includes recommendations for managing the vegetated sea cliffs. The main management considerations for the vegetated sea cliffs include the management of Invasive Alien Species, the compilation of a detailed hydrological survey and management plan, as well as scrub encroachment and other measures. For detailed management recommendations and further information on the vegetated sea cliffs habitat, please see the dedicated Vegetated Sea Cliffs Survey of Howth Head Report. The management recommendations for the SAC are summarised below:

- Complete a detailed hydrological survey and management plan assessing the current state of water courses along the sea cliffs of Howth Head SAC. This should include water quality assessments, as well as a management plan on how the piped/culverted areas of water can be de-piped/de-culverted to slow the loss of water and maximise the ecological potential of the water resources on the sea cliffs. The flushes along sea cliffs below Balscadden Road are of particular interest as these areas previously harboured a variety of rare plant species which are now generally in decline due to disturbances to their water sources upstream (Doogue 2019). Coulcoor Brook also outfalls in this area and would benefit in particular from a detailed survey as it is currently heavily culverted/piped;
- Complete an invasive plant survey of the entire length of sea cliffs of Howth Head SAC, including all areas surveyed by Dhúill and Smyth (2018). This survey should be repeated on a 4/5 year basis;
- Develop an Invasive Species Management Plan for the sea cliffs of Howth Head SAC;
- Develop a renewed eradication program for the recorded Hottentot fig (C*arpobrotus edulis*) populations, as this species is considered to have the highest potential for further spread on all areas of sea cliff habitat in Howth Head SAC, including vertical/near-vertical sections, which sections are naturally protected from most invasive plant species. All control/eradication of invasive species should be undertaken by an invasive species specialist contractor, with the guidance of a qualified botanist/ecologist;
- Develop trial areas of intermittent cutting of scrub on an e.g. biennial basis. Trial areas could include sections of the dense Prunus spinosa scrub in the Doldrum Bay area and on slopes to the south of the Whitewater Brook outfall. Monitoring surveys (including Permanent Quadrats) would be required annually for 3-5 years to closely observe vegetation changes. These trial areas may coincide with fire management strategies for coastal areas of Howth Head, and fire breaks could also be used as trial areas for clearance and monitoring. Other areas of extensive scrub which require control can be found along sea cliffs below Balscadden Road, and at Lions Head Beach (amongst others). Clearance at these various locations (depending on how much is controlled at each location) will allow the SSCO target, "*combined cover of bracken (Pteridium aquilinum) and woody species in coastal grassland on hard or soft cliff is <5%"* to be achieved in the future. The target grassland vegetation type to restore should be the 'ungrazed grassland on hard cliffs' zone type. Scilla verna is a rare Dublin species (Doogue et al. 1998) which occurs in this zone type in Howth Head SAC. However, it should be noted that, depending on the steepness of the cliff section, 'crevice and ledge' zone type communities may be restored instead;
- Goat grazing could be trialled on scrub-dominated areas of slope which are less steep, e.g. Doldrum Bay area;
- Aim for all areas of coastal grassland (on hard or soft cliff) to be below 5% combined cover of *Pteridium aquilinum* and woody species (including *Rubus fruticosus agg.*, *Ulex europaeus, Prunus spinosa, Hedera helix*, etc.); and for all areas of coastal heath (on sea cliff) to be maintained below 20% cover of scattered native trees, shrubs and

woody climbers, and below 10% cover of *Pteridium aquilinum*. Areas of scrub clearance may overlap with areas where sea cliff grassland can be promoted in its stead, as these areas will most likely revert to grassland after scrub clearance has taken place. In this way, both scrub reduction and coastal grassland enhancement can overlap.

Monitoring and research recommendations from the report are the following:

- Re-survey Permanent Quadrats (PQs) in 2027/2028, and continue this monitoring at four/five year intervals, with detailed comparison to previous survey periods;
- Establish further new plots in 2027/2028, if considered necessary, to expand the scope of the monitoring and capture further diversity in the plant communities and their change over time. These should focus on areas where management issues have been highlighted and/or actioned upon by Fingal County Council (e.g. scrub/invasive removal areas);
- More research needs to be completed on hard cliff flush communities, including the association of these flushes with the EU Habitats Directive Annex I habitats, [*7220] Petrifying springs with tufa formation (Cratoneurion), and [7230] Alkaline fens. The present author would suggest establishing a new zone type titled 'Flush/Spring on hard cliff', with an indicator species list and parameters based off of a detailed future vegetation study of the sea cliff flushes/springs in Howth Head SAC and other suitable hard cliff sites.

Education recommendations are the following:

- Educate local landowners on the threats caused by introducing and harbouring non-native invasive plant species (particularly species like *Carpobrotus edulis, Veronica × franciscana, Echium pininana*, etc.) in their gardens, particularly those adjacent to sea cliffs, e.g. along Balscadden Road, and residential properties near Doldrum Bay and Drumleck Point. Encourage them to plant native Irish plant species and remove invasives from their gardens, and to reduce mowing and promote grassland growth in their gardens. Patches of seminatural grassland, outcrop, scrub and other habitats may still survive in these now privatised areas of garden land and should be stewarded appropriately;
- Erect interpretation signage in areas of active management (e.g. in non-native invasive plant hotspots) to inform the public of its purpose.

### 4.1.2.3 Breeding Sea Birds

As outlined above, the cliffs of Howth form an important breeding site for a colony of seabirds and support a nationally important population of the Kittiwake. This population is the Special Conservation Interest for the protection of which, the Howth Head Coast Special Protection Area is designated. The Conservation Objective for this SPA is to *'To maintain or restore the favourable conservation condition of the bird species' (NPWS, 2022).*

The Kittiwake is a species of seabird that breeds on steep cliff faces in colonies with other bird species. It is red listed according to the Birds of Conservation Concern in Ireland 2022-2026 and is of high conservation value. It is globally classed as vulnerable. According to its Status Assessment 2023 by OSPAR, a collaboration by countries in the North Atlantic to protect the marine environment found that its decline is ongoing. OSPAR identified a key threat to Kittiwake in its sensitivity to pressures as it is relatively long living and reproduces relatively slowly. Key pressures include reduced food availability in northern habitats, temperature and food changes from climate change, commercial fisheries reducing food sources and potentially offshore renewables (OSPAR, 2023).

This plan recommends reducing disturbance near sea bird breeding sites through the following:

- Fence off areas susceptible to disturbance to prevent trampling and human disturbance (see Plate 4-4 for an example of a trampling path leading onto a breeding rock outcrop near the Baily lighthouse) as shown on Figure 4-2 (p.18);
- Signage to inform visitors about the bird;
- Collaborate with Birdwatch Ireland and other relevant organisations to collect monitoring data on breeding population annually to record population numbers and trends.

*Plate 4-4 Trampling path towards a rock outcrop with a sea bird breeding colony*

### 4.1.3 Looped Trials Management

Around half a million people avail of the four designated looped trails on Howth, all of which start at the Howth train station. There is also a network of other right of ways that traverse the SAC that are mainly used by the local community. Most of the looped trails are located on private property, but the County Council is responsible for the upkeep of this pathway network. Every two years the looped trails are inspected by Sports Ireland to make sure that they are safe, enjoyable to use and clearly signposted. A well maintained and signposted pathway network will encourage the public to use these pathways instead of the unofficial tracks that are contributing to the decline of Dry Heath in particular. Post and rope fencing and supporting signage is to be installed to restrict access at key viewing points where vegetation has been worn away due to excessive pedestrian use.

Significant path upgrading works were carried between 2019 and 2024 including the development of a new signage package of mapboards and waymakers for the looped trials. Ongoing minor repairs are required to address erosion of the pathway surface through footfall and water ponding on the pathways. Greywacke stone and Ballylusk gravel are used for path repairs because these types of stone do not influence the pH of the surrounding environment (Perrin and Barron, 2020). The repair works are undertaken by hand or with small scale machinery such as micro-diggers and mechanised wheelbarrows, to avoid damaging the surrounding vegetation including the Dry Heath and the Vegetated Seacliff habitats. The Bramble, Gorse and Bracken vegetation along the looped pathways needs to be cut back every year to prevent the pathways from becoming overgrown and hard to access. Most cuttings shall remain in place where cut, but larger cuttings will be bagged and removed from within the pathway corridor to avoid trip hazards. Cut material, and garden plants such as Hebes, are not to be dumped over the cliffs to avoid garden plants establishing themselves of the Vegetated Seacliffs.

A Standard Operating Procedure (SOP) is to be developed for regular pathway repairs and vegetation management along the pathways and this will be subject to an Appropriate Assessment. Public access management on Howth should take into account European and IUCN guidance towards managing visitors in or near protected sites (Alterra (Wageningen), European Centre for Nature Conservation and Eurosite, 2010; Leung *et al.*, 2018).

*Plate 4-5 Low level fencing restrict access at a major viewing point at the Nose of Howth*


*Plate 4-6 Example of Signage at Brettenham Heath, United Kingdom*

*Plate 4-7 Waymarking Signage along looped trials on Howth wayfinding*

Plate 4-8 Waymarking Signage along looped trials on Howth wayfinding

## 4.2 Management for Biodiversity

The optimisation of biodiversity within the SAC and SPA is the third priority of this management plan. In areas where heathland or vegetated sea cliffs are unlikely to have existed (at least at the time of designation in 1998) and are unlikely to be easily restored, alternative management is prescribed to optimise their biodiversity value.

A number of the reports that were commissioned by the SAAO mapped areas of woodland, grassland and wetlands of biodiversity value. In addition, a number of other reports recommend maintaining a mosaic of habitats as opposed to having large areas covered by a single habitat (e.g. Scrub). The main reports that provide information with respect to general biodiversity on Howth Head include the following:

- Howth Head Breeding Bird Survey (Natura Consultants, 2018)
- Howth Head Wetland Survey (Scott Cawley, 2021)
- Assessment of Red Squirrels on Howth (Carr, 2011)
- Protecting Howth's Habitats (Declan Doogue, no date)
- Common Lizard, *Zootoca vivipara* (Lichtenstein, 1823), Survey of Howth (Herpetological Society of Ireland, 2019)
- Spiders of Howth (Myles Nolan, 2020)
- Howth and Ireland's Eye Bryophyte Study (Denyer and Hodd, 2019)
- Recent Environment Change on Howth Head, County Dublin (Cooney, 1994)
- Howth Ground beetle Survey 2019 (Nessa Darcy, 2020)

The NPWS draft management plan for the Howth Head SAC (2005) makes note of other habitats within Howth Head SAC that

> *"Include dry grassland, wet flushes and small bogs, patches of scrub, mixed woodland, as well as shingle and sandy beaches, sea islets and open marine water."*

Habitats and Species that are not QIs of the SAC/SPA and where management interventions for general biodiversity enhancement are proposed are split into five broad categories:

- Wetlands and waterways
- Woodlands
- Scrub
- Grasslands
- Fauna of Note

### 4.2.1 Wetlands and streams

The Wetland Study Phase I Howth Co. Dublin report was commissioned by the SAAO, and notes that a large number of naturally occurring wetlands on Howth have been lost due to drainage works, scrub encroachment, invasive species, the diversion of watercourses and culverting of streams, (Scott Cawley, 2021). The bryophyte survey notes that creating a wetland can be beneficial to the local bryophyte presence(Denyer and Hodd, 2019). Additionally, wetlands are beneficial as buffer zones in fire management (Cathy Vaughan, 2023; Rewilding Britain, 2025). A number of wetland restoration projects are proposed within the SAC. The County Council has already carried out restoration works at the Bog of Frogs (Removal of Birch and blocking of outlet drain) and Green Hollows (removal of Rhododendron and Gorse scrub). The Council will be monitoring the vegetation development of these sites in the years to come to determine the success of these measures. .. . The wetland report outlines the following priority actions for wetlands with the Howth Head SAC, (Scott Cawley, 2021).

- Greenhollows: consider digging down into the old quarry pit with historic Floating Club-rush (*Eleogiton fluitans* rare or scare in Ireland (revised 2022) according to the BSBI plant atlas.)
- Whitewater Brook (partially in SAC): Removal of invasive species within the watercourse and restrict livestock access into the stream where it flows through a field between Windgate Road and Carrickbrack Road;
- Kilrock Quarries: Clearing of encroaching brambles and Gorse scrub, particularly in the eastern and south-western (but also the northern) voids;
- Nose of Howth: Develop ponds in areas of wet grassland vegetation and control Bramble and Bracken.
-

Following the successful implementation of these actions, progress should be monitored, wetlands resurveyed, and when resources are available, the other recommendations implemented where possible. A map showing the wetlands recommended for restoration as part of this management plan is available in Figure 4-7 below. The figure also shows waterways, including rivers, streams and drains as categorised by Scott Cawley (2021) and excludes QI areas and firebreaks.


## Map Legend

- Howth Head SAC and Howth Head Coast SPA

Wetland Feasability Zones

- Wetland

Rivers, Streams and Drains

- Culvert
- Depositing/lowland rivers
- Drainage Ditches
- Obvisouly modified
- Predominantly unmodified
- Significantly modified
- unknown



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| Drawing Title: Hydrological Potential for Biodiversity Enhancements | |
| Project Title: Howth Head SAC and Howth Head Coast Management Plan | |
| Drawn By: MT | Checked By: PR |
| Project No.: 240413 | Drawing No.: Figure 4-6 |
| Scale: 1:13,000 | Date: 2025-08-27 |

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### 4.2.2 Woodland

Howth is thought to have been nearly bare of trees from at least the 15th century to as late as the 19th century. The area around Muck Rock, now tree-clad, was portrayed as bare of trees in an 1820 painting by J.A O'Connor; while the portal dolmen known as Aideen's Grave was illustrated in an early painting by Joseph Banagher from 1760, which also showed the site to be treeless, with sweeping views of the sea, a few small shrubs, and some goats in the foreground of the painting providing evidence of past grazing (McBrierty 1981). However, individual native and exotic trees and shrubs have been planted around Howth demesne by successive generations of the St. Lawrence family. Ordnance Survey maps indicate that the woodland at Howth Demesne consisting of a mix of native and exotic broadleaf and conifer species was planted sometime between 1843 and 1870. The Rhododendron garden was planted on Muck Rock in 1850 (McBrierty 1981) and R. ponticum. has overtaken much of the understorey of the woods at Howth Demesne and is spreading onto the adjoining heathland. Most of the woodland in Howth Demesne and the Rhododendron gardens are included in the Howth Head SAC.

Pollen analysis carried out near the 'Bog of the Frogs' area has suggested that the vegetation on Howth included open Hazel, Alder and Birch scrub between the 15th century and 1830, with a small amount of Oak occurring throughout the earlier part of this period (Cooney, 1994). Hazel is rare in Howth woodlands today, while Alder persists mostly in a small, mixed Alder-Birch wood over flushed ground located just to the south-west of the GAA sports ground. Birch trees (mostly Betula pubescens with some B. pendula and hybrids) are locally very abundant, at the south fringe of the Howth demesne woods, and on the adjacent hills (Dun hill and Hilltop house). Birch, along with Scots Pine, are leading the woodland succession of the heath in the absence of grazing and burning. Other woodland colonists that have also been found in small numbers within the developing Birch woods include buckler fern (*Dryopteris dilatate*) and woodland germander (*Teucrium scordonia)*, as well as sapling sessile oak (*Quercus petraea)* and scattered Rowan (*Sorbus aucuparia).* All these species may be derived from propagules drifting in from the adjacent demesne woodland (Meleady, 1993). Common Bent-grass, (*Agrostis capillaris*), Wavy Hair Grass (*Deschampsia flexuosa*) and Bilberry (*Vaccinum myrtillus*), less common on the surrounding heath, are dominant species under the developing Birch woods on Howth, and are also characteristic species of Birch succession on heathland elsewhere (Hester et al., 1991).

The woodlands within the Howth SAC were classified by BEC in 2019 (Perrin and Barron, 2020) and are shown on Figure 4-7 (p.46 below) and numbered as follows:

1. The largest woodland in the Howth Head SAC is located at Howth Demesne around Muck Rock and comprises of a mix of native and exotic broadleaf and conifer species. Rhododendron Ponticum makes up most of the understorey in this woodland
2. The Birch woodland in the eastern section of Dunhill was recorded in 1996 imagery, supports patches of bracken and is being invaded by Rhododendron.
3. The woodland on Redrock was categorised as semi-natural and assessed in detail in a separate Arborist report(Arborist Associates Ltd., 2023).
4. A small patch of woodland in the Summit area below East Mountain was recorded as mainly sycamore and semi-natural woodland.
5. A large area of woodland at Hilltop House near the Ben of Howth was categorised as a semi-natural woodland with significant Rhododendron.
6. Woodland Garden at Earlscliff, comprising of a range of non-native tree species

The primary woodland conservation action is to eradicate *Rhododendron Ponticum* from all the woodlands within the SAC. It is envisaged that this will take time given the current extent of Rhododendron and the residual seed source. It is recommended that the Rhododendron in the developing Birch woodlands at Dun Hill and Hilltop house are dealt with first as the level of infestation is relatively low due to ongoing efforts there over the last 10 years to eliminate the Rhododendron. The Rhododendron in Howth Demesne should be dealt with working from south to north, thereby gradually creating a bufferzone between the Rhododendron gardens and the heathland to the south without any

*R. ponticum*. The potential of gradually replacing *R. ponticum* in the Rhododendron Gardens with other, non-invasive species of *Rhododendron* should also be explored.

The trees and the woodlands can be assessed in more detail once the Rhododendron in the understorey of the woods are cleared. This will allow for the preparation of woodland management plans that set out a how to create a structurally and species diverse woodland in this upland environment. The woodland at Howth Demesne would particularly benefit of a woodland management plan to address issues such as the lack of natural regeneration and guide the woodland recovery following the Rhododendron removal.

It is also recommended that consideration is given to allowing for the natural expansion of woodland into the areas currently covered by Bracken and/or Gorse that were not heather at the time of SAC designation. This will allow natural succession processes to take place within the SAC and create new woodland and scrub pockets in an otherwise open landscape, while not affecting the quality and extent of Dry Heath.

### 4.2.3 Scrub

Gorse and Bracken Scrub covers approx. 36% of the land within the SAC. Scrub encroachment is a threat to both Dry Heath and Vegetated Seacliff habitat. Dense bracken generally has low biodiversity value and currently makes up approximately 77% of all Scrub habitat on Howth. The extent of dense bracken is shown in Figure 4-7 (p.46) below.

Leaving Scrub 'as is' is not recommended as the fuel load and fire risk associated with Scrub, especially from Gorse scrub, is considered very high. The heathland report proposes to reduce the proportion of dense Bracken and Gorse scrub within the heathland landscape from 36% (91.28 ha) to 20% (51 ha) or less by conversion to Dry Heath, grassland or woodland to improve the overall conservation status of the SAC, and create a mosaic of habitats. This allows for greater structural habitat diversity, which will in turn is likely to support more invertebrates and plants (Natura Consultants, 2018; Myles Nolan, 2020; Nessa Darcy, 2020). Where species of note were recorded in biodiversity reports, special care in the removal of scrub is to be taken. For example, rare species of beetle were found in bracken stands, particularly on East Mountain. (Nessa Darcy, 2020).

It is recommended that ecological studies are carried out prior to the removal of Gorse or Bracken to ensure no protected or fauna of interest using the scrub are harmed.

Further information including methodologies on how to remove gorse and bracken is set out below.

- **Turn Scrub into Grassland**
- **Turn Scrub into Woodland**

#### 4.2.3.1 Gorse Scrub

Two species of Gorse occur on Howth Head. Western Gorse (*Ulex gallii*) is a positive indicator species, that occurs naturally in Dry Heath and its presence of less than 50% cover on Dry Heath is indicative of a favourable conservation condition (NPWS, 2016). Common Gorse (*Ulex europeaus*), while also native, is not a positive indicator species on Dry Heath and tends to outcompete western gorse and heathers. Accordingly, management efforts should focus on areas dominated by Common Gorse..

To create the desired mosaic, some of the Gorse will have to be removed permanently, while the remaining Gorse would benefit from a cyclical cutting regime. The cyclical cutting regime will help to create a diverse age structure and density within the remaining Gorse stands.

**Gorse Removal**

- To ensure the permanent removal of Gorse it is important that the whole plant, including the rootstock, is removed. Cutting the shrub at the base tends to result in significant regrowth that is almost impossible to get rid of. The Gorse can be pulled with a digger fitted with a grab. The pulled material can be shredded on site with a forestry flail and left behind or transported to an off-site location. The steep slopes on Shielmartin for example make it very difficult to remove any shredded material, while the Gorse stands along the Upper Cliff path on East Mountain are more accessible for trucks and machinery.
- Sustained goat grazing on a medium to high stocking density for a 4-5 year period can provide good control of mature Gorse in some situations. Male goats are used first to open up the mature Gorse stands, while nannies and kids can be used for maintenance grazing to keep any regrowth at bay. See Plate 4-9 for the results of goat grazing on Gorse at a site along the Carrickbrack Road.
- A mosaic should be created by removing Gorse in irregular shaped patches throughout the stands and not exceeding 30% of the management unit at any time.
- The cleared areas should be maintained through cutting the emerging vegetation once or twice a year and collecting the arisings, which are to be disposed off-site. Alternatively, the cleared areas are grazed with livestock where there is permission from the landowner to do so.
- To date, the removal of older mature Gorse stands in the wildfire breaks and combined with cutting has resulted in species poor grassland with a varying levels of Gorse regrowth. It should be noted that most of the meadows on slightly acidic soil on Howth tend to have a low species diversity, while species rich grassland can develop on the lime rich soils. A pH test of the soil in any given area should provide a reasonable prediction on what type of meadow is likely to develop where Gorse has been removed. Creation and management of meadows is set out in further detail in Section 4.2.4 (p.42)
- Clear Gorse around trees in areas where natural succession from scrub to upland woodland can be facilitated .
- Mechanical Gorse removal shall take place outside of bird breeding season, if possible.
- Livestock grazing with the aim of removing Gorse can be undertaken in short periods of high intensity grazing throughout the year

**Cyclical Maintenance of remaining Gorse stands:**

- Rotational cutting of gorse scrub on a 5-10 year cycle with various ages present within a management unit. Cutting can be done with shears or a circular saw mounted on a digger, chainsaws and pole cutters or hand saws. The cut material cant be left in the landscape as it poses a major wildfire risk. The material can be chipped and sprayed back into the Gorse stand if soil enrichment is not considered an issue. The chips can also be given to adjoining landowners a mulch or composted locally. Alternatively, all cut material can be brought to a central point where all the material is shredded using a forestry shredder. The shredded material is ideally disposed off site, but could be left in a central location if the funding available does not allow for disposal off-site. A third option is to remove the green parts of the cut Gorse and run that through a chipper. This material can be fed to goats, horses and cattle on Howth during the winter months. The timber part can be cut into firewood and dried locally and sold two years later as firewood. This third option represents a historical use of the cut material, but is more labour intensive and might be an option if there is a volunteer group available to undertake this work.
- Grazing with male goats prior to cutting works can help to open up a dense stand of mature Gorse. This makes it a lot easier for an operator to see the stems and the terrain, which makes mechanical management of Gorse easier and cheaper.

- In areas important for lizards, along the coast of East Mountain in particular, Gorse is recommended to be kept at a height of 30-100cm in mosaic with grass/ heath/ open rock habitat as lizards prefer occupying east to south facing, highly structural diverse microhabitats. (Herpetological Society of Ireland, 2019).


*Plate 4-9 Impacts of grazing by goats to dense stands of gorse on Howth.*

#### 4.2.3.2 Bracken

Bracken is of low value to biodiversity (Nessa Darcy, 2020; Fera Science Ltd, 2024) and should be controlled where it forms dense stands and suppresses other plants. Cutting for several years where there is a litter layer underneath Bracken is likely to lead to a sward dominated by grasses. (Natural England, 2008). Deep Bracken litter can hamper heather regeneration, and this litter layer may have to be removed to facilitate the establishment of Dry Heath habitat. The re-establishment of Calluna vulgaris heath was found to be directly related to the success of bracken control in previous studies (Snow and Marrs, 1997; Bardon et al., 2018; Moody and Holden, 2023). Three techniques for bracken control are suitable on Howth (Natural England, 2008; Natural Scotland, 2008; Shellwell *et al.*, 2016; Fera Science Ltd, 2024):

1. Intensive grazing/trampling to be undertaken on an ongoing basis to weaken the infestation over successive years. This can only be done in areas where there is a mix of grassland and Bracken, because Bracken is poisonous to livestock, particularly in the summer months;
2. Mechanical cutting and removal, or rolling/ crushing could be undertaken to weaken the plant in infested areas. The cutting and collecting of the Bracken can be done in places that are

accessible to larger machinery. Rolling/Crushing on steeper and/or rockier terreain can be undertaken with small diggers, a Quadbike and roller or remote controlled mulchers. .

a. This should be undertaken twice yearly over at least three years, ideally ten years (How to rewild, no date; Snow and Marrs, 1997). The first cut is to take place in mid-June to mid-July, when the bracken is at a height of approximately 50-75 cm and again six weeks later;

3. Natural England, 2008Cutting by hand with loppers, slashhooks or scythes is to be trialled in areas where neither grazing, cutting or rolling is feasible and where bracken poses a significant risk to spreading into neighbouring habitats. (How to rewild, no date; Snow and Marrs, 1997; Moody and Holden, 2023)
4. The use of chemical herbicide such as Asulox to eradicate Bracken is not recommended due to the potential impact on the surrounding habitats. ,

Cutting of bracken has to be continued for up to 10 years following commencement, otherwise it is expected to regrow to 80% of pretreatment densities within 4-6 years. Following rolling or bruising, at first shorter fronds and stems will be formed by Bracken plants adapting to the pressure. If rolling is stopped, bracken is expected to recover quickly. (Shellwell *et al.*, 2016) Shielmartin would be a useful location for trials to control bracken, as it is accessible for heavy machinery and dry heath was recorded in some of the areas now overgrown with bracken in 1996.

### 4.2.4 Grasslands

Most of the grassland on Howth that was formerly grazed can be divided into two broad types – species rich grasslands that have formed on the more lime-rich soils and a usually more species-poor grassland which has formed on more lime-deficient soils. The grasslands have been identified in several reports as being of considerable biodiversity significance and supports several rare plant species (Declan Doogue, no date; Herpetological Society of Ireland, 2019; Myles Nolan, 2020). Coastal grasslands near the Baily and on East Mountain notably supported a diverse range of maritime grassland species during the 2024 site visits. Additionally, these areas of grassland have a varied sward height and good habitat for a wide range of invertebrates including butterflies and moths (Smyth and Nash, 2008; National Biodiversity Data Centre, 2025).The breeding bird report highlights the 'significant insect populations' attracting birds that feed on them(Natura Consultants, 2018). Currently, some grasslands on Redrock are being grazed by highland cattle on low intensity, as a trial and for the keeping the vegetation height in firebreaks short. The location of existing grasslands that can be enhanced for biodiversity on Howth are shown on Figure 4-7 (p.46).

The maintenance of grasslands is also mentioned in the management of the vegetated sea cliffs habitat in Section 3.4.2. The sea cliffs report includes the recommendation to

> *"Aim for all areas of coastal grassland (on hard or soft cliff) to be below 5% combined cover of Pteridium aquilinum [Bracken] and woody species (including Rubus fruticosus agg., Ulex europaeus, Prunus spinosa, Hedera helix, etc.); and for all areas of coastal heath (on sea cliff) to be maintained below 20% cover of scattered native trees, shrubs and woody climbers, and below 10% cover of Pteridium aquilinum. Areas of scrub clearance may overlap with areas where sea cliff grassland can be promoted in its stead, as these areas will most likely revert to grassland after scrub clearance has taken place. In this way, both scrub reduction and coastal grassland enhancement can overlap"(Fitzgerald Ecology, 2023)*

Recommended management techniques to create long meadows as per the All-Ireland Pollinator Plan (National Biodiversity Data Centre, 2023) include:

- The major reduction in the amount of grassland on Howth is the result of the cessation of grazing in many areas. Restoring grazing with cows or horses at an appropriate level helps to prevent scrub encroachment and optimise habitat and sward diversity within the grasslands. Grazing of grassland by sheep or goats is not

recommended as there grazing behaviour keep vegetation too short. Proposed conservation grazing stocking densities ultimately need to be monitored and reviewed but are usually recommended to be around 0.2LU/hectare. Grazing would ideally be seasonal, whereby livestock is absent during the flowering season to maximise the amount of flowers. (Hart, Barry and Dunford, 2024; Irish Native Rare Breed Society, 2024);

- Conduct butterfly monitoring prior to cutting where rare butterflies likely to be present (for example large amount of devils bit scabious growing). Alternatively delay cutting until beginning of October;
- Consider removing tall weeds such as Docks, nettles, hogweeds, ragworts and thistles in March and August. A rule of thumb is to remove anything taller than knee height in the first years of meadow establishment. This will reduce their potential to dominate the meadow;
- Cutting and removing of a hay crop after a few days. Cutting to be undertaken late in the year (August/September) to allow species to set seed;
- Cut or crush the Bracken, where Bracken is invading species rich grassland
- Strewing seed rich hay from species rich grasslands on Howth Head to areas with poorer floral diversity;
- No herbicides or other chemicals are to be used. No fertiliser is to be used. Meadow diversity profits from low nutrient availability;

It is recommended that a detailed baseline surveys of the grassland areas on Howth Head be undertaken. Using this information, bespoke management prescriptions can be made for each grassland management unit to allow them to reach a favourable conservation status and optimise biodiversity.

### 4.2.5 Fauna of Note

Howth has a long history of being inhabited by noteworthy animals, such as the now extinct Irish Elk (*Cervus giganteus*) (Stokes, 1914). More recent noteworthy animal records include beetles and spiders now widely confined to Howth, and a considerate population of the only reptile in Ireland. Various reports prepared for target species on Howth were reviewed for this plan. Locations of faunal hotspots, where applicable, are indicatively shown in Figure 4-7 (p.46) below. Section 6 provides detailed management recommendations that took into account important locations and habitats for each of these species. The section below provides some background on each of these groups and how the proposed management plan aims to enhance their habitats.

#### 4.2.5.1 Birds

The seacliffs of the Howth Head SPA are home to thousands of breeding seabirds during the summer months, including the Kitiwake. Measures to protect these birds are described in Section 4.1.2.3 (p.34). Further inland, woodland and scrub support the greatest number of breeding species, while heath and grassland hold fewer species due largely to lack of cover. Typical upland species such as Grouse, Hen Harrier and Merlin do not occur on Howth. Gorse scrub supports species such as Stonechat (*Saxicola rubicola*), Linnet (*Linaria cannabina*), Whitethroat (*Sylvia communis*), Willow Warbler (*Phylloscopus trochilus*) and Lesser Redpoll (*Carduelis flammea*). These bird species will benefit from creating a mosaic of scrub to increase structural diversity and foraging opportunities. Only Meadow Pipit (*Anthus pratensis*) and Skylark (*Alauda arvensis*) were recorded nesting in unmanaged grassland while the Dry Heath supports species such as Wren (*Troglodytes troglodytes*) and Wheatear (*Oenanthe Oenanthe*). All these species will benefit from developing a more structurally diverse Dry Heath habitat and the replacement of Bracken and Gorse with grassland to provide more food and nesting opportunities. Furthermore, the Birch woodland near Dunhill is important for breeding birds, and is recommended to be kept as part of this management plan (Natura Consultants, 2018).

#### 4.2.5.2 Beetles

Howth supports several rare beetle species in its heath, scrub and bracken habitats. Of particular note was the recording of the *Platyderus depressus* ground beetle, which has not been recorded anywhere else in Ireland. This management plan recommends diversifying existing habitats on Howth, where many of these species will thrive. It also recommends keeping mature heath in good conditions, with structural improvements for a more varied age structure and to increase the total area of heathland in good condition. This is in line with the management recommendations from the beetle report (Nessa Darcy, 2020) and will likely be beneficial for invertebrates in general (Sanderson, Newton and Selvidge, 2020)

#### 4.2.5.3 Butterflies and Moths

A number of butterfly and moth species were recorded breeding on Howth and their conservation status checked against the latest red list for butterflies and Macromoths in Ireland. More recent data from the Irish Butterfly Monitoring Scheme found a 55% decline in butterfly numbers since 2008. To note is also that the 10-year population trend among butterflies is currently stable. (Regan *et al.*, 2010; Allen *et al.*, 2016; National Biodiversity Data Centre, 2024). The National Biodiversity Data Centre (2025) was also consulted. Species of note recorded across Howth from available data are presented with management recommendations where applicable below:

- Wall brown butterfly (*Lasiomata megera*) was categorised as 'Threatened' in the latest available Irish red list of butterflies. The butterflies are found on the steep, rocky areas in the hollow above the Baily Lighthouse. Wall Brown need stands of dry, dead grass. It was also recorded along other parts of the Howth coastline (Grid O33E, O33D, O23Y). It is proposed that the meadow management will increase the amount of dead and dry grass by along a larger sward height. Meadow management across the coast must take into account this butterfly, with surveying prior to mowing recommended in all grasslands on Howth.
- Small Heath butterfly (*Coenonympha pamphilus*), classed as 'Near Threatened' was confirmed in heathy margins of path from Summit to Baily lighthouse, approaching the main gate to the lighthouse complex. It is recommended to take special care for management along that path and continue to allow trampling in this specific area. Wall browns lay their eggs just at the edge of the path.
- The Forester Moth (*Adscita statices*) is currently classed as 'Endangered'. It occupies a similar habitat as the Wall Brown and Small Heath butterfly and responds well to similar management recommendations.
- The Grayling (*Hipparchia semele*), also 'Near Threatened' is found on steep, rocky areas in the hollow above the Baily lighthouse. Grayling was recorded along dozens of site between Baily and Balscadden, along the bay west of the Bailey lighthouse, locally referred to as Doldrum bay. The butterfly prefers heaps of spoil, including rock as habitat, plenty of which is available along the Baily.
- The small blue butterfly (*Cupido minimus*) classed as 'Endangered' has previously been recorded along the Howth Coast (Within Grid O23U and Grid O23Y).
- The Red Admiral was recorded along the coast, particularly in the west of the Baily lighthouse, near Doldrum Beach.

In terms of management recommendations, any changes affecting the area around the Baily stretching along the coast towards Redrock are to be undertaken cautiously and taking into account all available data on the exact location of butterflies to not disturb them. Annual monitoring of butterfly and macro moths within Howth SAC, especially from the Baily to Redrock, is recommended. The management plan envisions further grasslands to be created and to break up dense stands of scrub. Both of these measures are likely provide more suitable butterfly habitat.

#### 4.2.5.4 Spiders

A total of 95 species of spider have been recorded on Howth at the time of the last survey in 2020 (Myles Nolan, 2020). Some of these are rare and with very limited distribution in Ireland, such as *Ozyptila sanctuaria*, which is known to occur on only five hectads across five counties in Ireland. The most important habitats for spiders on Howth are heathlands and cliff faces. The largest threat on spiders is from scrub encroachment in this management plan includes recommendations to break up dense stands of Scrub.

#### 4.2.5.5 Lizards

Howth supports a large population of the only native Irish lizard. The viviparous lizard (*Zootoca vivipara)* was recorded across the SAC (except for the Ben of Howth) basking on open rock, and medium height gorse. The following recommendations from the lizard report (Herpetological Society of Ireland, 2019) will be fulfilled by this management plan:

- Where lizards are recorded in large numbers, particularly along the coast of East Mountain, it is recommended to cut the mosaic of Scrub to heights between 30-100cm;
- A complex of wetlands is proposed as biodiversity measure on the Nose of Howth;
- General control of bracken is proposed. This will improve lizard habitat connectivity and make new habitat available.

Woodland 1

Woodland 2

Woodland 3

Woodland 5

Woodland 4

Woodland 6

## Map Legend

- Howth Head SAC and Howth Head Coast SPA
- Butterfly hotspots
- Lizard hotspot
- Beetle hotspot

Biodiveristy Enhancement Potential

- Grassland
- Scrub
- Woodland



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Drawing Title: Terrestrial Potential for Biodiversity Enhancements

Project Title: Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
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| MT | PR |
| Project No. 240413 | Drawing No. Figure 4-7 |
| Scale 1:11,000 | Date 2025-02-28 |

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# 5. FURTHER STUDY

The management plan objectives and priorities that are set out above are based on the information that is currently available regarding the ecology of Howth Head. It is recommended to update the current baseline in order to fully and effectively implement the management prescribed, to monitor its success and to adapt where necessary to achieve the desired goals. It is also recommended to undertake surveys to fill any knowledge gaps that may affect the biodiversity management of the Howth Head SAC and Howth Head Coast SPA. A list of recommended further study and research on experimental heathland rehabilitation is provided in Section 4.1.2.1 (p.27). All other further study recommendations are provided below:

- Ongoing condition assessment of heathland to ensure that the management is working and to allow effective adaption where necessary to achieve favourable conservation status in line with the Conservation Objectives of the SAC;
- Drone survey of Howth Head to obtain detailed aerial imagery and topographical information. This could be repeated over time to monitor changes in vegetation structure and coverage (see Plate 5-1 as an example). Drone surveys may be a particular useful tool to survey the cliffs due to steep slopes and dangerous surveying conditions otherwise.
- Annual surveys of seabird populations to monitor populations of SCI species as a priority;
- Trial different gorse and bracken control options:
    - Refer to Section 4.1.2.1.1 (p.41) for proposed bracken control options;
    - Trial the establishment of native woodland in areas of dense bracken stands; A selection of suitable native trees should include hazel, birch and hawthorn(Cooney, 1994); Trail sites shown in Figure 5-1.
- Detailed survey of the grasslands within Howth Head, preparation of management plans to optimise biodiversity and associated monitoring;
- Heather beetle survey and mapping of affected areas. Trial cutting and grazing in areas impacted by heather beetle and monitor heath growth;
- Undertake breeding bird surveys of Howth Head every five years;
- Develop a detailed invasive species plan for the Seacliff habitat including dividing Howth Head into management units, mapping of invasive species within those areas, preparation of detailed plans for eradication following best practice guidelines;
- Undertaking experimental trials for nature-based fire control, heath re-establishment, scrub and bracken control methods;
- Surveying for rare and protected plant species previously recorded on Howth (Declan Doogue, no date).

*Plate 5-1 Screenshot of a drone image made available on google maps of the Nose of Howth (January 2022). Clear to see is the extent of bracken and damage from trampling.*

## Map Legend

- Bracken control trial areas
- Howth Head SAC and Howth Head Coast SPA



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| Drawing Title: Trial Bracken Control Areas (Shielmartin) | |
| Project Title: Howth Head Conservation Management Plan | |
| Drawn By: MT | Checked By: PT |
| Project No.: 240413 | Drawing No.: Figure 5-1 |
| Scale: 1:4,000 | Date: 2025-08-29 |

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# 6. MANAGEMENT PLAN

This detailed management plan sets out the recommended actions for Howth Head to assist in achieving the overall Vision (as per Section 2, p.7) and to facilitate the achievement of the Conservation Objectives of the Howth Head SAC and Howth Head Coast SPA.

The management actions are prioritised as per the hierarchy below (as per Section 4, p.12).

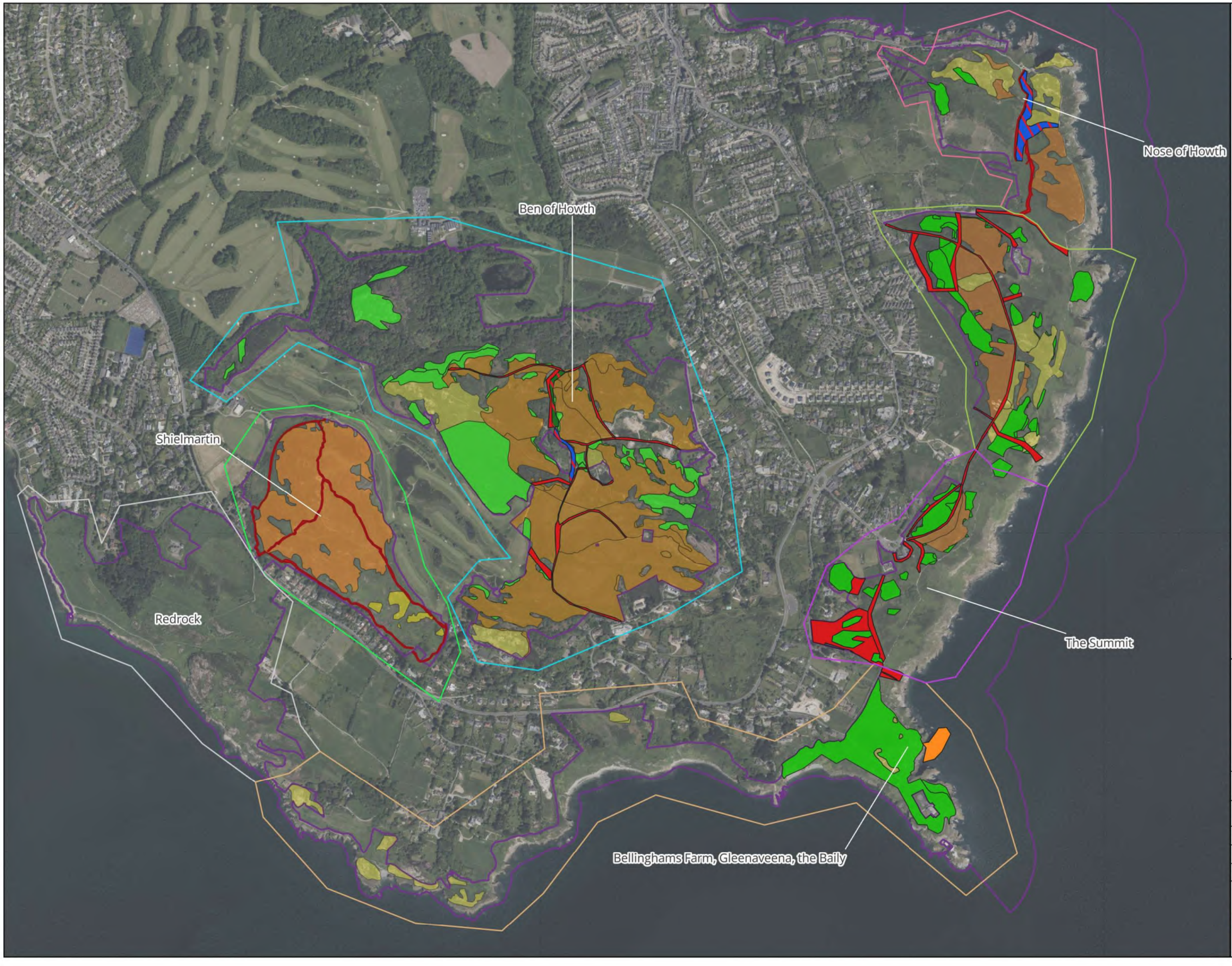
1. **Conservation and restoration of habitats and species for which the SAC and SPA are designated**
    a. Protection from Wildfires
    b. Maintain and restore the favourable conservation status of the Qualifying Interests (QIs)
    c. Public Access Management
2. **Other Biodiversity Enhancements**

Actions of the highest priority are shown in red in all associated maps. Second priority actions are shown in orange; third in yellow and fourth in green. Actions that do not fall into the priority hierarchy but are nonetheless valuable recommendations, are shown in various other colours in the mapping and explained in the legends thereof.

For the purposes of this plan and to facilitate effective management, Howth Head has been broken into six discreet management units, each of which are described separately in the following sections. These are shown on Figure 6.1 and include Ben of Howth, Shielmartin, Nose of Howth, East Mountain, The Summit and The Baily (including Gleenaveena and Bellingham's Farm). It is noted that Redrock is the subject of a separate management plan and is excluded from this plan.

Figure 6.1 shows the overall priorities actions for Howth Head whilst actions are set out in detail and prioritised per management unit in Sections 6.1 – 6.6 and associated mapping.

It should be noted that this plan is a live and working document that makes recommendations for management based on the vision and priorities set out above. The baseline information that is included in this management plan is provided by studies that were previously undertaken at Howth Head. For example, the information regarding the extent and condition of heathland habitats originates from a study that was undertaken in 2019. It is therefore recommended that up-to-date surveys are undertaken in any area prior to the implementation of any management action. It is intended that management actions can, and likely will, be adapted in certain areas in response to conditions encountered on the ground and following the results of the initial management interventions.




## Map Legend

- Howth Head SAC and Howth Head Coast SPA

**Priority Actions on Ben of Howth**

- Create and maintain Firebreak
- Maintain wetland as nature-based Firebreak
- Continue Woodland trials for nature-based Firebreak
- Enhance good dry Heath
- Improve Dry Heath and Visitor Access
- Control Scrub and restore low quality dry Heath

**Priority Actions on Shielmartin**

- Create and maintain Firebreak
- Restore good dry Heath following 2021 Wildfire
- Control Scrub and restore low quality dry Heath

**Priority Actions Nose of Howth**

- Create and maintain Firebreak
- Create wetland as nature-based Firebreak
- Enhance good dry Heath
- Improve Dry Heath and Visitor Access
- Control Scrub and restore low quality dry Heath

**Priority Actions for East Mountain**

- Create and maintain Firebreak
- Enhance good dry Heath
- Improve Dry Heath and Visitor Access
- Control Scrub and restore low quality dry Heath

**Priority Actions for the Summit**

- Create and maintain Firebreak
- Enhance good Heath
- Control Scrub and restore low quality dry Heath

**Priority Actions near Bellinghams, Baily**

- Create and maintain Firebreak
- Prevent Disturbance to Seabird Colony
- Enhance and restore Dry Heath
- Manage Bracken on biodiverse Grassland



Drawing Title: Complete Site Priority Actions

Project Title: Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-1 |
| Scale | Date |
| 1:11,000 | 2025-03-03 |

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## 6.1 Ben of Howth

The Ben of Howth is the central hill on Howth. Habitats on the Ben of Howth include good quality and mature dry heath, a woodland near Dunhill along the northern slope of the Ben of Howth, and intermittent scrub and grassland. The highest priority actions are associated with the creation and maintenance of firebreaks. The second highest priority actions involve management of areas of heathland that is currently in good condition to ensure it stays in good condition and to enhance it by providing an age structure. The third and fourth highest priorities involve the restoration of heathland that is not in good condition. Other recommended actions for biodiversity include woodland management and wetland creation and enhancement.

*Plate 6-1 Dry Heath and Scrub on the Ben of Howth*

## Map Legend

- Howth head SAC and Howth Head Coast SPA

Management Recommendations

- Create and Maintain Firebreaks
- Maintain Wetland as nature-based Firebreak
- Continue Woodland Trials as nature-based Firebreaks
- Enhance good dry Heath
- Improve Dry Heath and Visitor Access
- Control Scrub and Restore low quality Heath
- Enhance Woodland
- Create Mosaic of Scrub
- Restore Biodiverse Wetland
- Create Species-Rich Grassland

N



Drawing Title
Ben of Howth Management Recommendations

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-2 |
| Scale | Date |
| 1:5,500 | 2025-02-26 |

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*Table 6-1 Detailed Management Recommendations for the Ben of Howth.*

| Map legend Reference | Action | Background | Benefit | | | | Priority |
|---|---|---|---|---|---|---|---|
| | | | Fire Protection | Conservation Objectives | Biodiversity | Public Amenity | |
| Create and Maintain Firebreaks | › Continue current firebreak maintenance and keep vegetation height below 30cm in firebreaks (Gibson, Castellou and Tubridy, 2021). | The majority of firebreaks are currently in place and maintained through cutting and/ or grazing. It is recommended to continue these management actions in the interest of fire safety. | x | x | x | | |
| Maintain wetland as nature-based Firebreak | › Maintain wetland as firebreak as per ongoing Fingal County Council management;<br>› Monitor for habitat restoration success;<br>› Continuously review nature-based firebreaks with fire authority to ensure compliance with fire safety. | Fingal County Council has established wetlands to act as firebreak. Actions to maintain this nature-based firebreak will continue in line with Fingal County Council's wetland firebreak management. | x | x | x | | |
| Explore potential for Woodland Firebreak | › Determine if this area is best developed as a woodland fire break or wet grassland firebreak Monitor for habitat restoration success | This area is seasonally wet and can be developed as a woodland or wet grassland. A flora survey is to be undertaken to determine best habitat option. | x | x | x | | |
| Enhance good dry Heath | › Cut small patches (10-100m2 ) or graze within the mature heath to enhance structural diversity and prevent scrub and tree encroachment. Cut growing shoots and experiment in cutting height.<br>› Manage no more than 20% of mature heath per year<br>› Target 90% of mature heath across the Howth Head SAC over 25 years (equals to approx. 1.25 ha/ year on Ben of Howth)<br>› Monitor against Conservation Objectives | The heathland on Ben of Howth represents some of the oldest intact heath vegetation on Howth Head. However, there is little age diversity, which limits regrowth and threatens the resilience of the mature dry heath. Cutting and grazing recommendations aim to improve age diversity and kickstart new growth. A number of spiders and beetles associated | | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | › Prevent scrub encroachment in cut areas.<br>› Trial cutting in March/ April or September/ October for highest Heath regrowth. Cutting from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Prevent Rhododendron spread.<br>› Target scrub to remove within heathland and remove scrub where it is encroaching on heathland.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not established naturally after 2-3 as anticipated (see Section 4.1.2.1 p.27) on Heath Rehabilitation). | with mature heather were recorded on the Ben of Howth (Myles Nolan, 2020; Nessa Darcy, 2020). | | | | | |
| Improve Dry Heath and Visitor Access | › Install fencing and signage to avoid trampling on dry heath.<br>› Signage to be erected to educate about management actions undertaken and the benefits to heath, birds and other animals and plants by reducing disturbance.<br>› Monitor for heath recovery in fenced off areas against Conservation Objectives.<br>› Monitor for regrowth of new shoots and plants in areas of bare soil and consider rehabilitation if young heath does not reestablish naturally after 2-3 as anticipated (see Section 4.1.2.1 p.**Error! Bookmark not defined.** on Heath Rehabilitation). | Trampling through the heath has destabilised the soil and created medium to large sized patches of bare ground within, damaging heath plants within the paths. By preventing further trampling, existing heath plants should recover and spread over the trampled bare ground. | | x | x | x | |
| Control Scrub and restore low quality dry heath | › **Priority 1**. Clear Scrub through cutting and grazing where heath is most likely to return (not dense or established scrub) and establish maintenance routine to keep them clear.<br>› **Priority 2.** Continuously clear areas of Scrub within heath where the Scrub also poses a fire risk. (as per fire strategy (Gibson, Castellou and Tubridy, 2021).<br>› **Priority 3.** Clear all other scrub from heath. | This where heath is not currently in good condition, and is threatened by scrub, or where scrub has already encroached on heath. Bracken and gorse scrub further enrich the soil with nitrogen, which allows other species to outcompete heath. Therefore, heath rehabilitation is likely | x | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | › Remove all cuttings.<br>› Control gorse, bracken, invasives or grass if they start recolonising cleared patches to promote heath regeneration.<br>› Consider heath rehabilitation or testing soil parameters if no pioneer heath growth after 2-3 years.<br>› Birch control can be achieved through either goat grazing in spring or by herbicide application<br>› If soil too enriched for heath, consider topsoil removal trials or allowing to turn to mosaic of scrub. | necessary where scrub has been established, then cleared and where the topsoil was not removed. Birch is encroaching from Dunhill and should be prioritised for removal where it is growing in good quality heathland. Reducing dense scrub stands will be beneficial in providing a more complex habitat. | | | | | |
| Enhance Woodland | › Continue to eliminate Rhododendron.<br>› Undertake a detailed woodland survey to inform a woodland management plan. | The semi mature birch woodland near Dunhill is used as public amenity and is an important feature for biodiversity. It is adjacent to the Rhododendron gardens on Howth and under constant pressure from invasive Rhododendron. This woodland is important for birds. | | | x | x | |
| Create Mosaic of Scrub | › Break up dense stands of bracken and gorse using methodology set out in Section 4.2.3 (p.39).<br>› Cut Mosaic of Scrub either in undulating lines or in patches.<br>› Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Graze Scrub on medium/ high intensity.<br>› Manage up to 10% of Scrub on rotation yearly up to 30% of a management unit (approx. 3ha/ year across all of Howth Head).<br>› Begin with areas of high fuel load (as shown in fire strategy (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021), and where it threatens dry heath habitat. | Dense stands of Scrub have low biodiversity value due to limited variability in habitat conditions and little species diversity. However, some stands of gorse, or birch are used by breeding birds, small mammals and insects. By creating a diverse age structure, habitat will be provided for more species of fauna and flora. Furthermore, dense stands of gorse in particular are a fire risk due to their high fuel load | x | | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Consider scrub removal where stone walls are present to improve habitat for lizards.<br>› Eliminate Rhododendron. | | | | | | |
| Restore biodiverse Wetland | › The wetland report includes detailed management recommendations and further details. Management options include a topographical survey of wetlands, vegetation clearance, rewetting of areas.<br>› Maintain a mosaic of dry heath and wetland on Ben of Howth where this is currently occurring, where there is no dry heath growth and where indicator bryophytes were found (Denyer and Hodd, 2019). | Restoration and management of wetland habitats in this area, including the Bog of Frogs, is identified in the Wetland Report (Scott Cawley, 2021).Recommendations for management are made in the wetland report for each specific wetland in detail. The hydrology report notes further areas where wetlands would be feasible to be established from a hydrology perspective (Envirologic Ltd., 2021). These are shown on the map in blue. These areas are to be considered for wetland creation to increase biodiversity. Remnants of wetlands were found as mosaic within some of the good heath areas on the Ben of Howth, with indicator bryophytes growing in these slightly wetter undulations. | | | x | x | |
| Create Species-Rich Grassland | › Cut once a year in September/ October and remove cuttings or alternatively graze with traditional breeds on low stocking density; no herbicides;<br>› monitor species diversity in grasslands to determine if management has desired results. | There are pockets of grassland on site, which are threatened by scrub encroachment and exhibit limited plant diversity. Measures to enhance the grasslands aim at streamlining management to reduce nutrients in the soil, which may in turn increase forb diversity. By keeping grasslands at a longer sward height, hunting and breeding grounds for birds are created. Structural diversity in the sward, as well as allowing wildflowers to flower and set seed through late cutting will be beneficial for pollinators. | x | | x | | |

## 6.2 Shielmartin

Shielmartin is a second hill on Howth to the west of the Ben of Howth. A large area of good quality dry heath was mapped on this hill in 2019. However, vast amounts of dry heath burned in a wildfire in 2021 and site visits showed increasing scrub encroachment and, in some cases, areas previously mapped as dry heath turning into grassland. The restoration of dry heath in burned areas is addressed as a priority. Additionally, there is a stand of relatively tall growing scrub along the southwestern edge of the hill. There is a path that will be maintained as firebreak along this scrub, however a woodland could be planted here to trial seminatural woodlands as firebreak.

*Plate 6-2 Image of Shielmartin taken from Dunhill.*

## Map Legend

- Howth Head SAC and Howth Head Coast SPA

Management Recommendations

- Create and maintain Firebreak
- Restore good dry Heath following 2021 Wildfire
- Control Scrub and restore poor quality dry Heath
- Create Mosaic of Scrub
- Trial Woodland as firebreak
- Enhance Stream

N



Drawing Title
Shielmartin Management Recommendations

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
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| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-3 |
| Scale | Date |
| 1:3,000 | 2025-02-26 |

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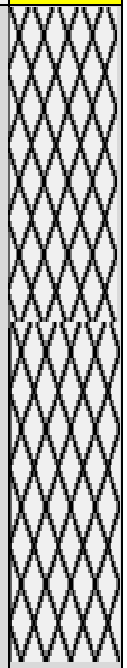
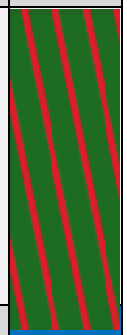
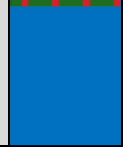
*Table 6-2 Detailed Management Recommendations for Shielmartin*

| Map legend Reference | Action | Background | Benefit | | | | Priority |
|---|---|---|---|---|---|---|---|
| | | | Fire Protection | Conservation Objectives | Biodiversity | Public Amenity | |
| Create and Maintain Firebreak | › Continue current firebreak maintenance and keep vegetation height below 30cm in firebreaks (Gibson, Castellou and Tubridy, 2021). | The majority of firebreaks are already in place and maintained through cutting and/or grazing. It is recommended to continue these management actions in the interest of fire safety. | x | x | x | | |
| Restore good dry Heath following 2021 Wildfire | › Monitor Shielmartin for heath regrowth;<br>› Keep scrub, particularly gorse and bracken short with the appropriate techniques such as grazing, cutting or rolling where these are suitable for the topography where mature heather was recorded pre the 2021 fires.<br>› Experimental reintroduction of heather through brash mats and reseeding to take place in trial plots where mature heather was previously recorded;<br>› If no heath regrowth is recorded after 7-9 years following the burn (after 2028), large-scale heath rehabilitation may be required. | Most of the mature, good quality heath recorded in 2019 has been destroyed by the hot burn on Shielmartin in 2021. Treat the fire as first management intervention in terms of timescales for recovery of dry heath (Shellwell *et al.*, 2016). Particularly on dry heaths, hot burns are likely to damage not only the plants but also the underlying humic layer and seedbank. If the humic layer was lost in the fire on Shielmartin recovery to building phase heather may take up to ten years, during which time the encroachment of scrub has to be prevented. | | x | x | | |
| Control Scrub and restore poor quality dry Heath | › **Priority 1**. Clear Scrub through cutting and grazing where heath is most likely to return (not dense or established scrub) and establish maintenance routine to keep them clear. | These are areas where heath is not currently in good condition and is threatened by encroaching scrub. Bracken and gorse scrub enrich the soil with nitrogen, which allows other species to outcompete heath. | x | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | › **Priority 2.** Continuously clear areas of Scrub within heath where the Scrub also poses a fire risk. (as per fire strategy (Gibson, Castellou and Tubridy, 2021).<br>› **Priority 3.** Clear all other scrub from heath.<br>› Cuttings are to be removed.<br>› Control gorse, bracken, invasives or grass if they start recolonising cleared patches to promote heath regeneration.<br>› Consider heath rehabilitation or testing soil parameters if no pioneer heath growth after 2-3 years.<br>› If soil too enriched for heath, consider topsoil removal trials or allowing to turn to mosaic of scrub, where topography of the site allows. | Encroaching scrub on Shielmartin is comprised of gorse, bracken and also encroaching grasses. | | | | | |
| Create Mosaic of Scrub | › Break up dense stands of bracken and gorse using methodology set out in Section 4.2.3 (p.39).<br>› Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Both grazing and mechanical cutting/ rolling may be used, depending on cost, topography and other relevant factors.<br>› Focus on reducing Scrub near the dry heath first and continue to keep scrub low where buffer zones were highlighted in the fire report (eastern half of Shielmartin).<br>› Cut Mosaic of Scrub either in undulating lines or in patches to allow for greater structural diversity for the benefit of biodiversity.<br>› If grazing is chosen, graze Scrub on medium/ high intensity.<br>› Manage up to 10% of Scrub on rotation yearly up to 30% of a management unit (approx. 3ha/ year across all of Howth Head, approx. 0.8 ha on Shielmartin).<br>› Begin with areas of high fuel load as shown in the fire strategy (Gibson, Castellou and Tubridy, 2021), and where it threatens | Dense stands of Scrub have low biodiversity value due to limited variability in habitat conditions and little species diversity. However, some stands of gorse, or birch are used by breeding birds, small mammals and insects. By creating a diverse age structure, habitat will be provided for more species of fauna and flora. Furthermore, dense stands of gorse in particular are a fire risk due to their high fuel load. | | x | x | x |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | dry heath habitat. Consider scrub removal where stone walls are present to improve habitat for lizards.<br>› Eliminate Rhododendron. | | | | | | |
| Trial Woodland as firebreak | › Commence plans to establish a wooded firebreak using native broadleaf tree species (Xanthopoulos, Calfapietra and Fernandes, 2012). This may include a planting plan and monitoring schedule.<br>› Ensure safety mechanisms of traditional fire breaks well maintained in case of failure. | The area marked in dark green on the map was proposed by Fingal County Council as a trial area for an experimental nature based wooded firebreak. Traditional firebreak management will be continued to ensure fire safety until the firebreak is established and has been trailed to be effective. (Marshall *et al.*, 2024). | x | | x | |  |
| Enhance Stream | › Remove overhanging vegetation, consider stream restoration such as adding rocks or boulders. | A small stream is present near the eastern end of Shielmartin. Enhancement would provide a nice wet feature can be used by fauna and flora as a drinking source and habitat. | | | x | x |  |

## 6.3 Nose of Howth

The Nose of Howth is situated at the northwestern end of Howth Head. Habitats at the Nose of Howth include dry heath, wetlands, grasslands and scrub. Some areas of dry heath are under a lot of pressure from visitor trampling and associated soil erosion. Priority actions for the nose of Howth include management for fire safety, visitor access and dry heath enhancement by removing scrub and reducing trampling paths. From a biodiversity point of view, the aim is to restore the quality and extent of some of the wetlands lost over time and to create a diverse structure in the scrub to provide more habitat niches. It is important to note that access to the Nose of Howth is restricted due to the elevation and ground conditions.

*Plate 6-3 Image of an area on the Nose of Howth with heather and gorse flowering.*

## Map Legend

- Howth head SAC and Howth Head Coast SPA

Management Recommendations

- Create and maintain Firebreak
- Create wetland as nature-based Firebreak
- Enhance good Heath
- Improve Dry Heath and Visitor Access
- Control Scrub and restore low quality dry Heath
- Restore Annex I Wetland
- Create Mosaic of Scrub
- Maintain Mosaic of Grass and Heath
- Restore Biodiverse Wetland
- Enhance Maritime Grassland

N



Drawing Title: Nose of Howth Management Recommendations

Project Title: Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
|---|---|
| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-4 |
| Scale | Date |
| 1:3,000 | 2025-03-03 |

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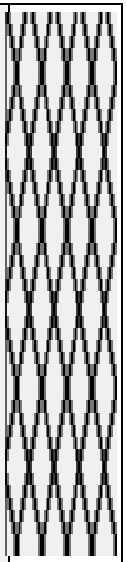
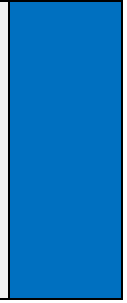
*Table 6-3 Detailed Management Recommendations for the Nose of Howth*

| Map legend Reference | Action | Background | Benefit | | | | Priority |
|---|---|---|---|---|---|---|---|
| | | | Fire Protection | Conservation Objectives | Biodiversity | Public Amenity | |
| Create and Maintain Firebreak | › Continue current firebreak maintenance and keep vegetation height below 30cm in firebreaks (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021). | The majority of firebreaks are currently in place and maintained through cutting and/ or grazing. It is recommended to continue these management actions in the interest of fire safety. | x | x | x | | |
| Create wetland as nature-based Firebreak | › Create wetland to act as firebreak. Monitor for habitat restoration success;<br>› | Wetlands, when wet year-round and in good condition, can function as nature-based firebreaks. (Cathy Vaughan, 2023). Fingal County Council has identified this location as a suitable location for a wetland firebreak based on the recommendation in the wetland report (Scott Cawley, 2021). The establishment of a wetland firebreak, once well maintained, will also double as a valuable wetland habitat. | x | x | x | | |
| Enhance good Heath | › Cut small patches (size of patches to be determined following experimentation) or graze within the mature heath to enhance structural diversity and prevent encroachment. Cut growing shoots and experiment in cutting height.<br>› Manage no more than 20% of mature heath per year<br>› Target 90% of mature heath over 25 years (equals to approx. 1.62ha/ year)<br>› Monitor against Conservation Objectives<br>› Prevent scrub encroachment in cleared areas. | Good Quality Heath was recorded mostly along the coast and is under pressure from encroaching scrub and trampling. Where good quality heather is growing, this is to be protected in a first instance from pressures to prevent loss of this habitat. Where mature heath requires management to improve its age composition, cutting or grazing may be employed. . | | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | › Trial cutting in March/ April or September/ October for highest Heath regrowth. Cutting from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Target scrub to remove within heathland and remove scrub where it is encroaching on heathland.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not established naturally after 2-3 as anticipated (see Section 4.1.2.1 p.27 on Heath Rehabilitation). | | | | | | |
| Improve Dry Heath and Visitor Access | › Install fencing to avoid trampling on dry heath and guide visitors to main visitor paths.<br>› Signage to be erected to educate about management actions undertaken and the benefits to heath, birds and other animals and plants by reducing disturbance.<br>› Monitor for heath recovery in fenced off areas against Conservation Objectives.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not established naturally after 2-3 as anticipated (see Section 4.1.2.1 p.27 on Heath Rehabilitation). | Trampling through the heath has destabilised the soil and created medium to large sized patches of bare ground within, damaging heath plants within the paths. By preventing further trampling, existing heath plants should recover and spread over the trampled bare ground. | | x | x | x | |
| Control Scrub and restore low quality dry heath | › **Priority 1**. Clear Scrub through cutting and grazing where heath is most likely to return (not dense or established scrub) and establish maintenance routine to keep them clear. | This is where heath is not currently in good condition, and is pressured by scrub, that has already encroached on the heath. Bracken and gorse scrub further enrich the soil with nitrogen, which allows other species to outcompete heath. Heath | x | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | › **Priority 2.** Continuously clear areas of Scrub within heath where the Scrub also poses a fire risk. (as per fire strategy (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021).<br>› **Priority 3.** Clear all other scrub from heath.<br>› Cuttings are to be removed.<br>› Control gorse, bracken, invasives or grass if they start recolonising cleared patches to promote heath regeneration.<br>› Consider heath rehabilitation or testing soil parameters if no pioneer heath growth after 2-3 years.<br>› If soil too enriched for heath, consider topsoil removal trials or allowing to turn to mosaic of scrub. | rehabilitation is likely necessary where scrub has been established, then cleared and where the topsoil was not removed. Reducing dense scrub stands will also be beneficial for biodiversity, as insects such as beetles and spiders are likely to profit from the mosaics of habitats created. | | | | | |
| Restore Annex I wetland | › Follow the recommendations in wetland report to restore this wetland to Annex I ([7230] Alkaline fens).<br>› Monitor habitat restoration rate and for positive indicator species for the Annex I habitat.<br>› Restrict access to this rea where necessary.<br>› Monitor for rare bryophytes such as *Campyliadelphus elodes* and *Scapania undulata* | The quarry pond at Kilrock quarries is a base-flushed fen, with many notable wetland bryophytes indicating Annex I habitats. Two species of bryophytes that have not been recorded since the 19th Century in the County of Dublin were recorded in this wetland (Kilrock Quarries, site 5 in the wetland report). Due to the importance of this wetland site for bryophyte and as Annex I habitat, this should be restored (Scott Cawley, 2021)(Scott Cawley, 2021). | | | x | x | |
| Create Mosaic of Scrub | › Break up dense stands of bracken and gorse using methodology set out in Section 4.2.3 (p.39).<br>› Cut Mosaic of Scrub either in undulating lines or in patches. | Dense stands of Scrub have low biodiversity value due to limited variability in habitat conditions and little species diversity. However, some stands of gorse, or birch are used by breeding birds, small mammals and insects. By creating a diverse age structure, habitat will be provided for more species of | x | | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | › Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Graze Scrub on medium/ high intensity.<br>› Manage up to 10% of Scrub on rotation yearly up to 30% of a management unit (approx. 3ha/ year across all of Howth Head, approx. 0.8 ha/ year on Nose of Howth).<br>› Continue management in areas of high fuel load (as shown in fire strategy (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021), and where it threatens dry heath habitat. Consider prioritising scrub removal where stone walls or open rock surface is present to improve habitat for lizards. | fauna and flora. Furthermore, dense stands of gorse in particular are a fire risk due to their high fuel load. | | | | |  |
| Maintain Mosaic of Grass and Heath | › Prioritize removal of invasive alien plant species.<br>› Remove Scrub of this habitat where possible.<br>› Monitor for heath regrowth | The heathland study recorded a mosaic habitat of grass and heath in this area. Due to challenges by the cliff location and the steep topography on site, management options are limited. However, an effort will be made to prevent scrub and nonnative plant encroachment. | | | | |  |
| Restore biodiverse Wetland | › The wetland report includes detailed management recommendations and further details on restoration Management options include a topographical survey of wetlands, vegetation clearance, rewetting of areas. | Restoration and management of wetland habitats in this area, identified in the Wetland Report (Scott Cawley, 2021).Recommendations for management are made in the wetland report for each specific wetland in detail. The hydrological study sets out areas where wetland restoration would be feasible. Wetland restoration would be very beneficial for general biodiversity. | | | x | x |  |

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|---|---|---|---|---|---|---|---|
| Enhance Maritime Grassland | › Cut once a year in September/ October and remove cuttings or alternatively graze with traditional breeds on low stocking density; no herbicides;<br>› monitor species diversity in grasslands to determine if management has desired results. | There are currently pockets of grassland on site, which are threatened by scrub encroachment and exhibit limited plant diversity. Measures to enhance the grasslands aim at removing scrub and reducing nutrients in the soil, which may in turn increase sward diversity. By keeping grasslands at a longer sward height, hunting and breeding grounds for birds are created. Structural diversity in the sward, as well as allowing wildflowers to flower and set seed through late cutting will be beneficial for pollinators. | x | | x | | |

## 6.4 East Mountain

Habitats on East Mountain is currently made up of some heath habitats in good condition, extensive stands of European gorse, and some patches of grassland. After fire management, the priority for East Mountain will be to enhance good dry heath, manage visitor access and cut back gorse as it is currently not only a fire risk, due to high fuel load, but also has low biodiversity value due to little structural diversity.

*Plate 6-4 Image of East Mountain showing a mosaic of scrub, heath and grassland.*

## Map Legend

- Howth Head SAC and Howth Head Coast SPA

Management Recommendations

- Create and maintain Firebreak
- Enhance good Heath
- Improve Dry Heath and Visitor Access
- Control Scrub and restore low quality dry Heath
- Create Mosaic of Scrub
- Enhance species-rich Grassland



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Drawing Title
East Mountain Management Recommendations

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
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| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-5 |
| Scale | Date |
| 1:3,500 | 2025-03-03 |

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*Table 6-4 Detailed Management Recommendations for East Mountain*

| Map legend Reference | Action | Background | Benefit | | | | Priority |
|---|---|---|---|---|---|---|---|
| | | | Fire Protection | Conservation Objectives | Biodiversity | Public Amenity | |
| Create and Maintain Firebreaks | › Continue current firebreak maintenance and keep vegetation height below 30cm in firebreaks (Gibson, Castellou and Tubridy, 2021). | The majority of firebreaks are currently in place and maintained through cutting. It is recommended to continue these management actions in the interest of fire safety. | x | x | x | | |
| Enhance good Heath | › Cut small patches (size of patches to be determined following experimentation) or graze within the mature heath to enhance structural diversity and prevent encroachment. Cut growing shoots and experiment in cutting height.<br>› Manage no more than 20% of mature heath per year<br>› Target 90% of mature heath over 25 years (equals to approx. 0.2 ha/ year on East Mountain).<br>› Monitor against Conservation Objectives<br>› Prevent scrub encroachment in cleared areas.<br>› Trial cutting in March/ April or September/ October for highest Heath regrowth. Cutting from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Prevent spread of garden plants, with a focus on legally regulated invasive species.<br>› Target scrub to remove within heathland and remove scrub where it is encroaching on heathland.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not | Considerable areas of good quality dry heath were recorded on East Mountain in 2019 (Perrin and Barron, 2020). However, encroaching scrub was noted as a major issue since, particularly from gorse. Therefore, addressing the scrub encroachment on good quality on Dry heath on East Mountain is of utmost importance to prevent loss of good quality dry heath habitat. Following this intervention, improving age composition would likely be a second step in enhancing the good quality dry heath, following an on-site assessment of what is needed. | | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | established naturally after 2-3 as anticipated (see Section 4.1.2.1 p.27 on Heath Rehabilitation). | | | | | | |
| Improve Dry Heath and Visitor Access | › Install fencing and signage to avoid trampling on dry heath.<br>› Monitor for heath recovery in fenced off areas against Conservation Objectives.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not established naturally after 2-3 as anticipated (see Section Section 4.1.2.1 p.27 on Heath Rehabilitation). | Trampling through the heath has destabilised the soil and created medium to large sized patches of bare ground within, damaging heath plants within the paths. By preventing further trampling, existing heath plants should recover and spread over the trampled bare ground. | | x | x | x | |
| Control Scrub and restore poor quality dry heath | › **Priority 1**. Clear Scrub through cutting and grazing where heath is most likely to return (not dense or established scrub) and establish maintenance routine to keep them clear.<br>› **Priority 2.** Continuously clear areas of Scrub within heath where the Scrub also poses a fire risk. (as per fire strategy (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021).<br>› **Priority 3.** Clear all other scrub from heath.<br>› Control gorse, bracken, invasives or grass if they start recolonising cleared patches to promote heath regeneration.<br>› Consider heath rehabilitation or testing soil parameters if no pioneer heath growth after 2-3 years.<br>› If soil too enriched for heath, consider topsoil removal trials or allowing to turn to mosaic of scrub. | This where heath is not currently in good condition, and is threatened by scrub, that has already encroached on the heath. Bracken and gorse scrub further enrich the soil with nitrogen, which allows other species to outcompete heath. Cuttings are to be removed. Heath rehabilitation is likely necessary where scrub has been established, then cleared and where the topsoil was not removed.. Use the fire report to identify where fuel load form Scrub is highest for Action 2. Reducing dense scrub stands is beneficial for biodiversity, particularly for the number of beetles, spiders and lizards recorded along the coast of East Mountain. | x | x | x | | |
| Create Mosaic of Scrub | › Break up dense stands of bracken and gorse using methodology set out in Section 4.2.3 (p.39).<br>› Cut Mosaic of Scrub either in undulating lines or in patches. | Dense stands of Scrub have low biodiversity value due to limited variability in habitat conditions and little species diversity. However, some stands of gorse, or birch are used by breeding birds, small mammals and | x | | x | | |

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|---|---|---|---|---|---|---|---|
| | › Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Graze Scrub on medium/ high intensity.<br>› Manage up to 10% of Scrub on rotation yearly up to 30% of a management unit (approx. 3ha/ year across all of Howth Head, approx. 1.3 ha on East Mountain).<br>› Begin with areas of high fuel load (as shown in fire strategy (Gibson, Castellou and Tubridy, 2021), and where it threatens dry heath habitat. Consider scrub removal where stone walls are present to improve habitat for lizards.<br>› Prevent the spread of invasive species.<br>› Monitor for butterflies, beetles and lizards and ensure they are not harmed by cutting operations. This may require pre-commencement surveys, particularly for the lizards. | insects. By creating a diverse age structure, habitat will be provided for more species of fauna and flora. Furthermore, dense stands of gorse in particular are a fire risk due to their high fuel load. A mosaic of scrub will also reduce the fuel load by removing plant mass. The scrub on East Mountain is particular important as a habitat for beetles, spiders and lizards. Many birds also breed in the scrub, so it is important to ensure the mature stands of Scrub remain for the birds. For lizards, recorded along the coast of east mountain, scrub is to be cut between to heights between 30-100cm; | | | | | |
| Enhance species-rich Grassland | › Cut once a year in September/ October and remove cuttings or alternatively graze with traditional breeds on low stocking density; no herbicides;<br>› monitor species diversity in grasslands to determine if management has desired results. | There are currently pockets of grassland on site, which are threatened by scrub encroachment and exhibit limited plant diversity. Measures to enhance the grasslands aim at streamlining management to reduce nutrients in the soil, which will in turn increase forb diversity. By keeping grasslands at a longer sward height, hunting and breeding grounds for birds are created. Structural diversity in the sward, as well as allowing wildflowers to flower and set seed through late cutting will be beneficial for pollinators. | x | | x | | |

## 6.5 The Summit

The Summit is located south of east Mountain, and is made up of some dry heath, and large stands of gorse. Bracken is spreading from East Mountain towards the Baily lighthouse and is covering a large area. This management plan recommends wildfire management, and the control of Gorse and bracken, and the management of coastal grasslands for biodiversity.

*Plate 6-5 Image of the Summit towards the Baily lighthouse showing the extent of scrub encroachment in this area with bracken encroachment in the front and gorse encroachment further in the background.*

## Map Legend

- Howth Head SAC and Howth Head Coast SPA

Management Recommendations

- Create and maintain Firebreak
- Enhance good Heath
- Control Scrub and restore low quality dry heath
- Create Mosaic of Scrub
- Enhance Maritime Grassland
- Enhance Woodland



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Drawing Title
The Summit Management Recommendations

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
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| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-6 |
| Scale | Date |
| 1:3,500 | 2025-03-03 |

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*Table 6-5 Detailed Management Recommendations for the Summit*

| Map legend Reference | Action | Background | Benefit | | | | Priority |
|---|---|---|---|---|---|---|---|
| | | | Fire Protection | Conservation Objectives | Biodiversity | Public Amenity | |
| Create and Maintain Firebreaks | › Continue current firebreak and fuelbreak maintenance and keep vegetation height below 30cm in firebreaks (Gibson, Castellou and Tubridy, 2021). | The majority of firebreaks are currently in place and maintained through cutting. It is recommended to continue these management actions in the interest of fire safety. | x | x | x | | |
| Enhance good Heath | › Cut small patches (size of patches to be determined following experimentation) or graze within the mature heath to enhance structural diversity and prevent encroachment. Cut growing shoots and experiment in cutting height.<br>› Manage no more than 20% of mature heath per year<br>› Target 90% of mature heath over 25 years (equals to approx. 0.05 ha/ year)<br>› Monitor against Conservation Objectives<br>› Prevent scrub encroachment in cleared areas.<br>› Trial cutting in March/ April or September/ October for highest Heath regrowth. Cutting from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Target scrub to remove within heathland and remove scrub where it is encroaching on heathland.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not established naturally after 2-3 as anticipated (see Section 4.1.2.1 p.27 on Heath Rehabilitation). | Considerable areas of good quality dry heath were recorded on East Mountain in 2019 (Perrin and Barron, 2020). However, encroaching scrub was noted as a major issue since, particularly from gorse. Therefore, addressing the scrub encroachment on good quality on Dry heath on East Mountain is of utmost importance to prevent loss of good quality dry heath habitat. Following this intervention, improving age composition would likely be a second step in enhancing the good quality dry heath, following an on-site assessment of what is needed. | | x | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Control Scrub and restore low quality dry heath | › **Priority 1**. Clear Scrub through cutting and grazing where heath is most likely to return (not dense or established scrub) and establish maintenance routine to keep them clear.<br>› **Priority 2.** Continuously clear areas of Scrub within heath where the Scrub also poses a fire risk. (as per fire strategy (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021).<br>› **Priority 3.** Clear all other scrub from heath.<br>› Control gorse, bracken, invasives or grass if they start recolonising cleared patches to promote heath regeneration.<br>› Consider heath rehabilitation or testing soil parameters if no pioneer heath growth after 2-3 years.<br>› If soil too enriched for heath, consider topsoil removal trials or allowing to turn to mosaic of scrub. | This where heath is not currently in good condition, and is threatened by scrub, that has already encroached on the heath. Bracken and gorse scrub further enrich the soil with nitrogen, which allows other species to outcompete heath. Cuttings are to be removed. Heath rehabilitation is likely necessary where scrub has been established, then cleared and where the topsoil was not removed. Where Scrub has established on top of dry heath in areas of high fuel load, these are to be cleared first. Use the fire report to identify where fuel load form Scrub is highest for Action 2. Reducing dense scrub stands will likely be beneficial for insects, lizards and other fauna found on Howth. Particular care is to be taken when clearing bracken in are B3 on the Summit, where dense bracken stands provide habitats for rare beetles. Consider, in line with the beetle report, to keep bracken stands in this area. Care is also to be taken to not harm any lizards using the bracken. | x | x | x | | |
| Create Mosaic of Scrub | › Break up dense stands of bracken and gorse using methodology set out in Section 4.2.3 (p.39).<br>› Cut Mosaic of Scrub either in undulating lines or in patches.<br>› Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015). | Dense stands of Scrub have low biodiversity value due to limited variability in habitat conditions and little species diversity. However, some stands of gorse, or birch are used by breeding birds, small mammals and insects. By creating a diverse age structure, habitat will be provided for more species of fauna and flora. Furthermore, dense stands of gorse in particular are a fire risk due to their high fuel load. | x | | x | | |

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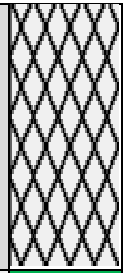
|---|---|---|---|---|---|---|---|
| | › Manage up to 10% of Scrub on rotation yearly up to 30% of a management unit (approx. 3ha/ year across all of Howth Head, approx. 0.5 ha on the Summit).<br>› Begin with areas of high fuel load (as shown in fire strategy (Gibson, Castellou and Tubridy, 2021), and where it threatens dry heath habitat. Consider scrub removal where stone walls are present to improve habitat for lizards.. | | | | | |  |
| Enhance woodland | › Enhance woodland through planting of native tree species, tolerant of coastal conditions such as willow or hazel.<br>› Remove any nonnatives and extensive gorse scrub and bracken. An alternative to removing bracken is to plant young trees and let them shade out the bracken over time. | A small area of woodland has been recorded near the Summit. It mainly consists of Sycamore, a broadleaf tree that is not native, however used by some fauna. The woodland could be enhanced by thinning the sycamore from the woodland and replacing with native trees. Coastal woodland in this location would be quite important for biodiversity. | | | x | x | |
| Enhance Maritime Grassland | › Cut once a year in September/ October and remove cuttings or alternatively graze with traditional breeds on low stocking density; no herbicides;<br>› monitor species diversity in grasslands to determine if management has desired results. | Grassland areas managed to create species rich and diverse swards, and invasive species eradicated (as per Section 4.4.4 p.42). This area is important for butterflies and maintenance of the grassland is therefore important (NBDC, 2025). A report for the management of the cliffs on Howth has also recommended to remove scrub from cliffs, which is in line with this recommendation (Fitzgerald Ecology, 2023). | x | | x | | |

## 6.6 The Baily, Glenaveena and Bellingham's Farm

The Baily, Glenaveena and Bellingham's Farm is an area along the coast of Howth from the Baily lighthouse to Redrock. The area has large areas of steep cliffs, where access for management may be difficult. Most of the cliffs are covered in scrub, with some patches of heath remaining within. Biodiverse grasslands are present near the Baily lighthouse and will be enhanced as part of this management plan. Dumping of garden waste was highlighted in previous reports as a threat to introduce new invasive species(Dhúill and Smyth, 2018)..

*Plate 6-6 View from the Baily lighthouse towards Glenaveena showing steep cliffs and a mosaic of grassland and scrub.*

## Map Legend

- Howth Head SAC and Howth Head Coast SPA

Management Recommendations

- Create and maintain Firebreak
- Prevent Disturbance to Seabird Colony
- Enhance and Restore Dry Heath
- Manage Bracken on biodiverse Grassland
- Create Mosaic of Scrub
- Enhance Maritime Grassland
- Enhance Stream
- Enhance Woodland

N



Drawing Title
Baily, Bellinghams and Gleenaveena Management Recommendations

Project Title
Howth Head SAC and SPA Management Plan

| Drawn By | Checked By |
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| MT | PR |
| Project No. | Drawing No. |
| 240413 | Figure 6-7 |
| Scale | Date |
| 1:6,300 | 2025-02-26 |

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*Table 6-6 Detailed Management Recommendations for the Baily, Gleenaveena and Bellingham's Farm*

| Map legend Reference | Action | Background | Benefit | | | | Priority |
|---|---|---|---|---|---|---|---|
| | | | Fire Protection | Conservation Objectives | Biodiversity | Public Amenity | |
| Create and Maintain Firebreaks | › Continue current firebreak maintenance and keep vegetation height below 30cm in firebreaks (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021). | The majority of firebreaks are currently in place and maintained through cutting. It is recommended to continue these management actions in the interest of fire safety. | x | x | x | | |
| Prevent Disturbance to Seabird Colony | › Close the footpath leading onto the rock where birds are resting and breeding.<br>› Put up signage to inform the public of birds and create safe visitor platform for birdwatching at a suitable distance to not disturb the birds. | Multiple protected coastal bird species are using this location within the SAC to breed and rest. This includes Kittiwake, for which the Howth Head Coast SPA is designated. The main threat is disturbance by the public. A small, dangerous trample path is leading onto the rock outcrop used by the birds. It is recommended to close this path and put up informational signage about the birds. | | x | x | | |
| Enhance and restore dry Heath | › Install fencing and signage to avoid trampling on dry heath.<br>› Prevent scrub encroachment on dry heath where this is the main pressure<br>› Monitor for heath recovery in fenced off areas against Conservation Objectives.<br>› Monitor for regrowth of new shoots and plants in cut areas and consider rehabilitation if young heath is not established naturally after 2-3 as anticipated (see Section 4.1.2.1 p.27 on Heath Rehabilitation). | No good quality dry heath is left along the Baily. Areas shown in yellow represent where dry heath habitat has been recorded. There are multiple pressures facing the heath. Most heath was found on rocky coastal outcrops, where the exposed location, trampling and scrub encroachment are major issues. Any restoration and enhancement of dry heath would be small scale in nature as only small patches of dry heath were previously recorded. | | x | x | x | |

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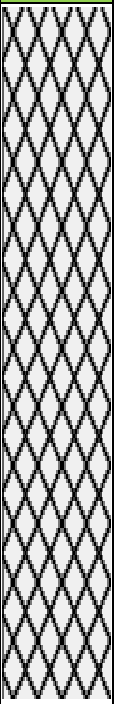
|---|---|---|---|---|---|---|---|
| Manage bracken on biodiverse Grassland | › Reduce the amount of scrub on the Baily as per management recommendations for bracken management in Section 4.2.3 (p.39).<br>› Once bracken is controlled, keep a high sward of grasses, do not use chemicals and do not allow heavy machinery access.<br>› Consider the lifecycle of butterflies and lizards prior to management interventions.<br>› Put up informational signage for visitors to the area | The Baily is of outstanding importance to a number of threatened butterfly species and to lizards, particularly along the walls of the lighthouse. No path management is recommended along the outer coastal path, as butterflies currently use the trampled edge of the path to breed. The biggest pressure on this habitat comes from encroaching bracken.. | x | x | x | | |
| Create Mosaic of Scrub | › Break up dense stands of bracken and gorse using methodology set out in Section 4.2.3 (p.39).<br>› Cut Mosaic of Scrub either in undulating lines or in patches.<br>› Cutting/ bruising/ rolling or other vegetation management from March to August inclusive will be done in compliance with the Birds and Natural Habitats (amendment) regulations 2015 (S.I. 355/2015).<br>› Graze Scrub on medium/ high intensity.<br>› Manage up to 10% of Scrub on rotation yearly up to 30% of a management unit (approx. 3ha/ year across all of Howth Head).<br>› Begin with areas of high fuel load (as shown in fire strategy (Gibson, Castellou and Tubridy, 2021)(Gibson, Castellou and Tubridy, 2021), and where it threatens dry heath habitat. Consider scrub removal where stone walls are present to improve habitat for lizards.<br>› Eliminate invasive species. | Dense stands of Scrub have low biodiversity value due to limited variability in habitat conditions and little species diversity. However, some stands of gorse, or birch are used by breeding birds, small mammals and insects. By creating a diverse age structure, habitat will be provided for more species of fauna and flora. Furthermore, dense stands of gorse in particular are a fire risk due to their high fuel load. A mosaic of scrub will also reduce the fuel load by removing plant mass. Manage particularly carefully (i.e. minimise damage from machinery, trampling, do not cut in areas important for butterflies) to habitats suitable to support butterflies such as rocky and grassy areas. | x | | x | |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Enhance maritime Grassland | › Cut once a year in September/ October and remove cuttings or alternatively graze with traditional breeds on low stocking density; no herbicides;<br>› monitor species diversity in grasslands to determine if management has desired results. | Grassland areas managed to create species rich and diverse swards, and invasive species eradicated (as per Section 4.1.2.1 p.42). This area is important for butterflies and maintenance of the grassland is therefore important (NBDC, 2025). A report for the management of the cliffs on Howth has also recommended to remove scrub from cliffs, which is in line with this recommendation (Fitzgerald Ecology, 2023). | x | | x | | |
| Enhance Stream | › Remove overhanging vegetation, consider stream restoration such as adding rocks or boulders. | A small stream was recorded flowing near the boundary to the Summit. The majority of the stream runs outside the SAC, however small actions can enhance this part of the stream. | | | x | x | |
| Enhance Woodland | › Enhance woodland through planting of native tree species, tolerant of coastal conditions such as willow or hazel.<br>› Remove any invasives or extensive gorse scrub and bracken. | Dense cover of the invasive *Echium pininana* species. was tentatively recorded in the heathland study in this woodlandPerrin and Barron, 2020). Replacement of these species and enhancing the woodland with native species could provide suitable habitat for birds, mammals and other species. | | | | | |

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# APPENDIX 1

***CONSERVATION OBJECTIVES: HOWTH HEAD SAC 000202 NPWS (2016)***

ISSN 2009-4086

# National Parks and Wildlife Service

## *Conservation Objectives Series*

## Howth Head SAC 000202

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

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**Citation:**

**NPWS (2016) Conservation Objectives: Howth Head SAC 000202. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.**

**Series Editor: Rebecca Jeffrey**
**ISSN 2009-4086**

## Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

**Notes/Guidelines:**

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

## Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

| 000202 | Howth Head SAC |
|---|---|
| 1230 | Vegetated sea cliffs of the Atlantic and Baltic coasts |
| 4030 | European dry heaths |

**Please note that this SAC overlaps with North Bull Island SPA (004006) and Howth Head Coast SPA (004113) and adjoins North Dublin Bay SAC (000206) and Rockabill to Dalkey Island SAC (003000). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.**

# Supporting documents, relevant reports & publications

*Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications*

## NPWS Documents

| | |
|---|---|
| **Year :** | 2011 |
| **Title :** | National survey and assessment of the conservation status of Irish sea cliffs |
| **Author :** | Barron, S.J.; Delaney, A.; Perrin, P.M.; Martin, J.; O'Neill, F. |
| **Series :** | Irish Wildlife Manual No. 53 |
| **Year :** | 2012 |
| **Title :** | Ireland Red List no. 8: Bryophytes |
| **Author :** | Lockhart, N.; Hodgetts, N.; Holyoak, D. |
| **Series :** | Ireland Red List series, NPWS |
| **Year :** | 2013 |
| **Title :** | The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments |
| **Author :** | NPWS |
| **Series :** | Conservation assessments |
| **Year :** | 2014 |
| **Title :** | Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0 |
| **Author :** | Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B. |
| **Series :** | Irish Wildlife Manual No. 79 |
| **Year :** | 2016 |
| **Title :** | Howth Head SAC (site code: 202) Conservation objectives supporting document- coastal habitats V1 |
| **Author :** | NPWS |
| **Series :** | Conservation objectives supporting document |

## Other References

| | |
|---|---|
| **Year :** | 1988 |
| **Title :** | The Irish red data book 1. Vascular plants |
| **Author :** | Curtis, T.G.F.; McGough, H.N. |
| **Series :** | Wildlife Service, Dublin |
| **Year :** | 2002 |
| **Title :** | A Catalogue of Alien Plants in Ireland |
| **Author :** | Reynolds, S.C.P. |
| **Series :** | National Botanic Gardens, Glasnevin |
| **Year :** | 2005 |
| **Title :** | National inventory of sea cliffs and coastal heaths |
| **Author :** | Browne, A. |
| **Series :** | Unpublished Report to NPWS |

## Spatial data sources

| | |
|---|---|
| **Year :** | 2011 |
| **Title :** | National survey and assessment of the conservation status of Irish sea cliffs |
| **GIS Operations :** | Clipped to SAC boundary |
| **Used For :** | 1230 (map 3) |

## Conservation Objectives for : Howth Head SAC [000202]

### 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts

**To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Howth Head SAC, which is defined by the following list of attributes and targets:**

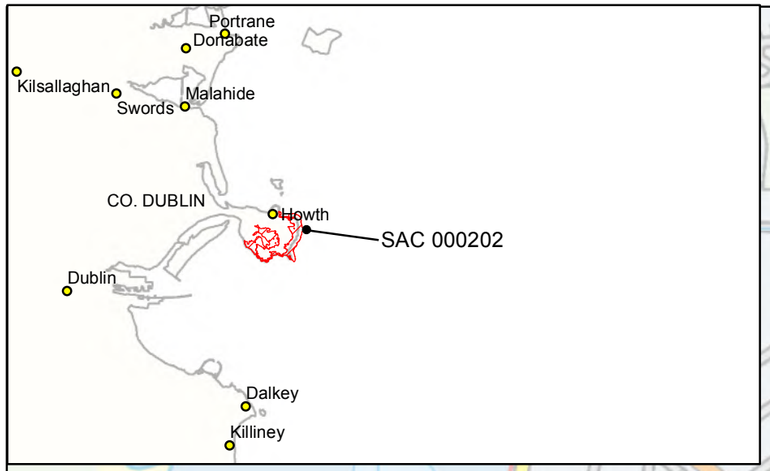
| Attribute | Measure | Target | Notes |
|---|---|---|---|
| Habitat length | Kilometres | Area stable, subject to natural processes, including erosion. Total length of cliff: 8.22km. See map 3 | Cliffs are linear features and are therefore measured in kilometres. The Irish Sea Cliff Survey (Barron et al., 2011) identified the site, though did not survey it, and the length of cliffs within Howth Head SAC is estimated to be 8.22km. The length of cliff is likely to be underestimated. See the Howth Head SAC conservation objectives supporting document for coastal habitats for further details |
| Habitat distribution | Occurrence | No decline, subject to natural processes. See map 3 | See map 3 for the estimated distribution of sea cliffs in the SAC. Hard cliffs have been noted in this SAC and it is thought that all of the cliffs are of the hard type (Browne, 2005). See the coastal habitats supporting document for further details |
| Physical structure: functionality and hydrological regime | Occurrence of artificial barriers | No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures | Attribute and target based on Barron et al. (2011). Maintaining natural geomorphological processes, including natural erosion, is important for the health of vegetated sea cliffs. Hydrological processes maintain flushes, and in some cases tufa formations, that can be associated with sea cliffs. See the coastal habitats supporting document for further details |
| Vegetation structure: zonation | Occurrence | Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession | Attribute and target based on Barron et al. (2011). A mosaic of European dry heath (4030) vegetation and maritime grassland occurs on the slopes above the sea cliff vegetation at Howth Head SAC. See the coastal habitats supporting document for further details |
| Vegetation structure: vegetation height | Centimetres | Maintain structural variation within sward | Attribute and target based on Barron et al. (2011). See the coastal habitats supporting document for further details |
| Vegetation composition: typical species and sub-communities | Percentage cover at a representative number of monitoring stops | Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011) | In places, the cliffs at Howth Head SAC comprise fairly sheer, exposed rock faces. The maritime flora is of particular interest as a number of scarce and local plants have been recorded. Some of these are species of ledges on hard cliffs and coastal heath. See the coastal habitats supporting document for further details |
| Vegetation composition: negative indicator species | Percentage | Negative indicator species (including non-natives) to represent less than 5% cover | Attribute and target based on Barron et al. (2011). Hottentot fig (*Carpobrotus edulis*) is an aggressive invader of coastal habitats that poses a serious ecological threat. The first record for hottentot fig in the wild in Ireland is from Howth Head in 1962 (Reynolds, 2002). See the coastal habitats supporting document for further details |
| Vegetation composition: bracken and woody species | Percentage | Cover of bracken (*Pteridium aquilinum*) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20% | Attribute and target based on Barron et al. (2011). Bracken occurs on the cliffs tops at Howth Head and there is some scrub encroachment on the heath. See the coastal habitats supporting document for further details |

## 4030 European dry heaths

**To maintain the favourable conservation condition of European dry heaths in Howth Head SAC, which is defined by the following list of attributes and targets:**

| Attribute | Measure | Target | Notes |
|---|---|---|---|
| Habitat area | Hectares | Area stable or increasing, subject to natural processes | European dry heath has not been mapped in detail for Howth Head SAC and thus the total area of the qualifying habitat is unknown. Dry heath is the dominant habitat within the SAC and occurs on the slopes above the sea cliffs and in the central part of the peninsula. The habitat occurs in mosaic with other habitats, such dry grassland and exposed rock in places (NPWS internal files) |
| Habitat distribution | Occurrence | No decline, subject to natural processes | See note on area above |
| Ecosystem function: soil nutrients | Soil pH and appropriate nutrient levels at a representative number of monitoring stops | Maintain soil nutrient status within natural range | Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013) |
| Community diversity | Abundance of variety of vegetation communities | Maintain variety of vegetation communities, subject to natural processes | The diversity of dry heath communities within this SAC is unknown. Information on vegetation communities associated with this habitat is presented in Perrin et al. (2014) |
| Vegetation composition: lichens and bryophytes | Number of species at a representative number of 2m x 2m monitoring stops | Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding *Campylopus* and *Polytrichum* mosses | Attribute and target based on Perrin et al. (2014). Dry heath is not necessarily rich in lichen and bryophyte species, but a minimum amount should still be present |
| Vegetation composition: number of positive indicator species | Number of species at a representative number of 2m x 2m monitoring stops | Number of positive indicator species present at each monitoring stop is at least two | Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. Bell heather (*Erica cinerea*), ling (*Calluna vulgaris*) and western gorse (*Ulex gallii*) are listed as present in the dry heath in this SAC (NPWS internal files) |
| Vegetation composition: cover of positive indicator species | Percentage cover at a representative number of 2m x 2m monitoring stops | Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath | Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented |
| Vegetation composition: dwarf shrub composition | Percentage cover at a representative number of 2m x 2m monitoring stops | Proportion of dwarf shrub cover composed collectively of bog-myrtle (*Myrica gale*), creeping willow (*Salix repens*) and western gorse (*Ulex gallii*) is less than 50% | Attribute and target based on Perrin et al. (2014). Bog-myrtle is indicative of flushed conditions and is more characteristic of wet heaths and blanket bogs. Creeping willow is more characteristic of dune heaths. Western gorse is a component of dry heath, but high proportions of it may indicate a history of undesirable levels of grazing |
| Vegetation composition: negative indicator species | Percentage cover at a representative number of 2m x 2m monitoring stops | Total cover of negative indicator species less than 1% | Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habiat is also presented |
| Vegetation composition: non-native species | Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops | Cover of non-native species less than 1% | Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances. Rhododendron (*Rhododendron ponticum*) occurs in places on dry heath in this SAC |
| Vegetation composition: native trees and shrubs | Percentage cover in local vicinity of a representative number of monitoring stops | Cover of scattered native trees and shrubs less than 20% | Attribute and target based on Perrin et al. (2014). High cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing |

| | | | |
|---|---|---|---|
| Vegetation composition: bracken | Percentage cover in local vicinity of a representative number of monitoring stops | Cover of bracken (*Pteridium aquilinum*) less than 10% | Attribute and target based on Perrin et al. (2014). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community |
| Vegetation composition: soft rush | Percentage cover in local vicinity of a representative number of monitoring stops | Cover of soft rush (*Juncus effusus*) less than 10% | Attribute and target based on Perrin et al. (2014). High cover of soft rush would suggest undesirable hydrological conditions. Note however, that poor flushes dominated by soft rush can naturally occur in mosaic with this habitat. Discrete areas of this separate habitat should not be considered here |
| Vegetation structure: senescent ling | Percentage cover at a representative number of 2m x 2m monitoring stops | Senescent proportion of ling (*Calluna vulgaris*) cover less than 50% | Attribute and target based on Perrin et al. (2014). Senescence is part of the natural cycle of ling, but a dominance of ling in the senescent phase would indicate a lack of management (appropriate grazing or burning) to promote ling regeneration |
| Vegetation structure: signs of browsing | Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops | Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing | Attribute and target based on Perrin et al. (2014) |
| Vegetation structure: burning | Occurrence in local vicinity of a representative number of monitoring stops | No signs of burning in sensitive areas | Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. Fires can be part of the natural cycle of dry heath and may also be used as a valuable management tool to promote a diversity of growth phases in ling (*Calluna vulgaris*). However, fires which are too intense, too frequent, too extensive or which occur in sensitive areas are damaging to the habitat |
| Vegetation structure: growth phases of ling | Percentage cover in local vicinity of a representative number of monitoring stops | Outside sensitive areas, all growth phases of ling (*Calluna vulgaris*) should occur throughout, with at least 10% of cover in the mature phase | Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. The growth phases of ling are pioneer (<10cm high), building (10-30cm high) and mature (<30cm high). As burning is undesirable in sensitive areas, it is not reasonable to require the stated diversity of growth phases within these areas |
| Physical structure: disturbed bare ground | Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops | Cover of disturbed bare ground less than 10% | Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human foot prints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands |
| Indicators of local distinctiveness | Occurrence and population size | No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat | This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Curtis and McGough, 1988; Lockhart et al., 2012) |




## Legend

Howth Head SAC 000202

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

**MAP 1:**
**HOWTH HEAD SAC**
**CONSERVATION OBJECTIVES**
**SAC DESIGNATION**

Map to be read in conjunction with the NPWS Conservation Objectives Document.

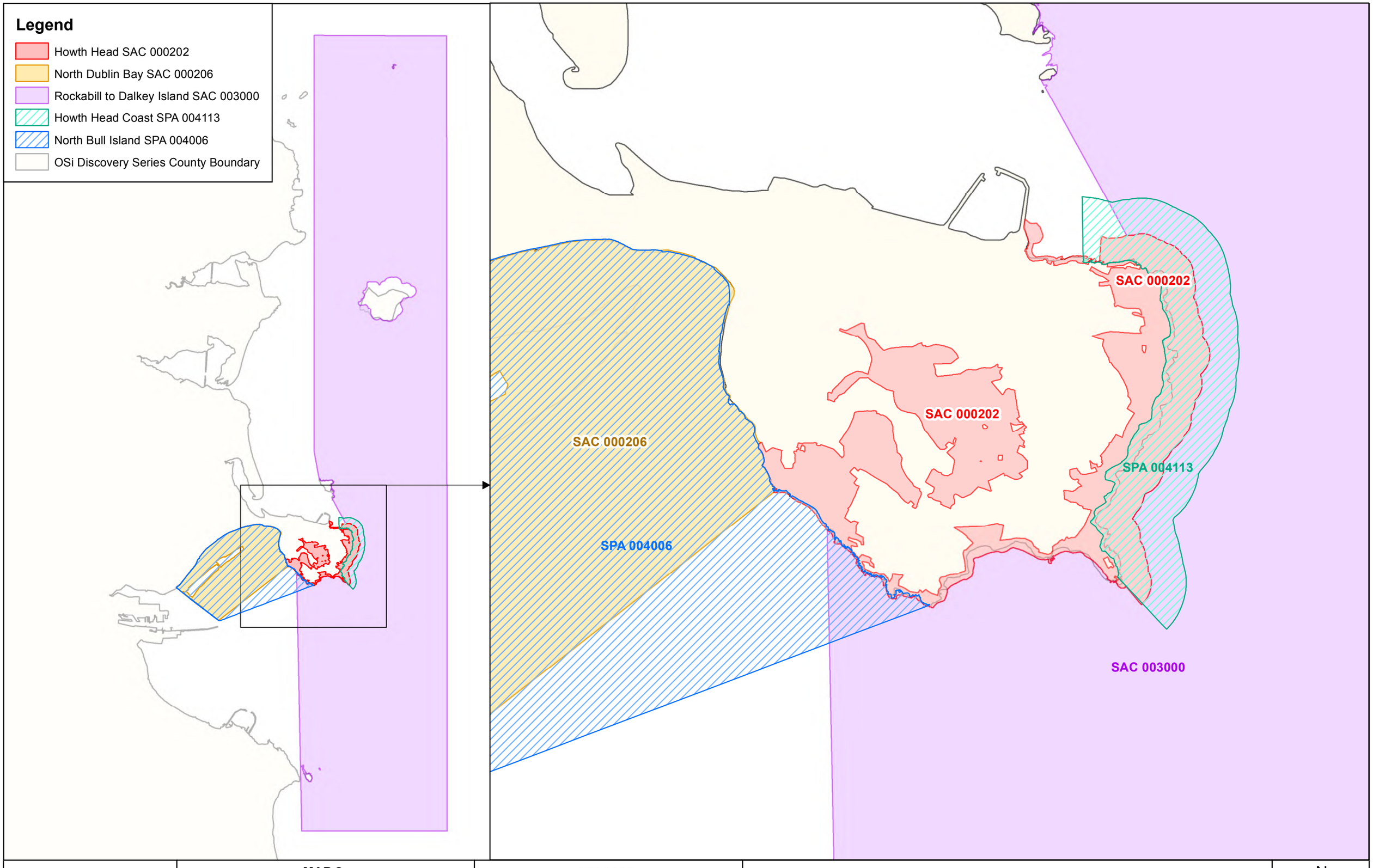
**SITE CODE:**
**SAC 000202; version 3.02 CO. DUBLIN**

0 0.25 0.5 0.75 1 km



N

**Map Version 1**
**Date: July 2016**




An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

**MAP 2:**
**HOWTH HEAD SAC**
**CONSERVATION OBJECTIVES**
**ADJOINING, OVERLAPPING AND ADJACENT DESIGNATIONS**

Map to be read in conjunction with the NPWS Conservation Objectives Document.

**SITE CODE:**
**SAC 000202; version 3.02. SAC 000206; version 3. SAC 003000; version 3.02. SPA 004113; version 3. SPA 004006; version 3 CO. DUBLIN**

0 3 6 9 12 km



N

**Map Version 1**
**Date: Oct 2016**

**Legend**

- Howth Head SAC 000202
- 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
- OSi Discovery Series County Boundary

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

# MAP 3:
# HOWTH HEAD SAC
# CONSERVATION OBJECTIVES
# VEGETATED SEA CLIFFS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

**SITE CODE:**
**SAC 000202; version 3.02.**
**CO. DUBLIN**

0 0.25 0.5 0.75 1 km



N

**Map Version 1**
**Date: Oct 2016**

# APPENDIX 2

## *INDICATIVE COSTING OF PLAN*

# INDICATIVE COSTING OF PLAN

The table below provides an approximate cost for the management recommendations set out in this plan. This is an indicative estimate of costs (in euro) at the time of writing of this plan. Estimates of costs have been provided by Fingal County Council based on quotes provided by contractors for similar work to date and management prescriptions have been separated for the purposes of this estimate. Area size is based on data collated for the heathland study (Perrin and Barron, 2020), and has been adjusted for damage to Shielmartin, where good heath habitat was lost in a wildfire. It was also adjusted to areas where dry heath likely existed in 1996. Not all information was available for each management prescription. This section was written to aid in the allocation of resources and to assist in cost-benefit calculations for the implementation of this plan. This is based on contractor's prices; however voluntary citizen engagement could also be encouraged to reduce the overall cost of some of these works.

In total, an estimate of 684 k can be placed on costing this management plan per year, where an approximate cost is known. This does not include for all recommendations, as grazing and woodland, wetland and other once off set up and maintenance cost could not be estimated. Potential costs for monitoring are also not included as they are not known. The cost is therefore not all-inclusive and will likely be higher. The table below is a rough estimate to summarise costs for this very complex, and ultimately on ground truthing dependent management plan.

| **Management Prescription** | **Total Area/ lengths of Intervention** | **Minimum Frequency** | **Price/ha** | **Yearly cost** | **10 year estimated cost** |
|---|---|---|---|---|---|
| Firebreaks maintenance (goat grazing and mechanical maintenance) | 10,000m | Twice yearly | / | 100k | 1 million |
| Structural composition improvement on good heath, cut and collect<br><br>(does not include for price for heath rehabilitation) | 45 ha total area good quality heath<br><br>90% of 45 ha = **40.5ha** | Small Patch Rotational cutting within 25 years of 90% of area | 49.5k/ ha | Assumes 90% of hectare over 25 years, yearly cut = 1.62 ha<br><br>1.62ha x 49.5 =**80k** | 800k |
| Rhododendron Control | / | Ongoing for at least 5 more years. Includes 300k for Rhododendron control in woodland and 200k for heathland. | / | 100 k | 500k |

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|---|---|---|---|---|---|
| Invasives on cliff control | / | / | / | 50k | 500k |
| Public footpath management | | / | / | 50k | 500k |
| Only dense Bracken Control (as habitat mapped by BEC (mechanical) | 18ha | Costed for yearly (better twice yearly) | 3k/ ha | 54k | 540k |
| Mosaic Scrub control including bracken and gorse (mechanical) on entire site | 50.4ha x 0.3? = **15.1ha/ 10 years**<br>**(30%= 0.3 = of total scrub)** | 15.1ha/10 years= **1.5ha/yr**<br>0.75 ha/ per bracken, 0.75ha/ gorse | 74.1 k/ ha for Gorse<br>3k/ ha for bracken<br>Average: 74.1k x 3k/ 2= **38.5 k/ha** | 58 k | 580 k |
| Tree Management in Dry Heath + grazing East Mountain and Ben of Howth with Goats and cattle (cost to cover extra herder, goats + cattle) | / | / | / | 80k | 800k |
| Bracken control Trial Shielmartin | 3.2 ha | 5 years management | 3k/ ha | (9.6k) | 48k |
| Gorse Control Trial East Mountain | 0.8 ha x 0.3= 0.24 ha/year<br>**(30%= 0.3 = of total scrub)** | 5 years management | 74k/ ha | (18k) | 90k |
| Grassland to meadow (cutting and remove cuttings) | 37.4ha | Yearly, estimate is for easily accessible sites – | 3k/ ha | 112k | 187k |
| Total (using the lower estimate and excl. trial sites, to avoid double-counting with total area of scrub to be managed) | | | | 684k | |